OPERATION & SERVICE MANUAL

Model: YM9000

Central Monitoring System (CMS)

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INTRODUCTION

YM9000 Central Monitoring System (CMS) Overview

The YM9000 Central Monitoring System (CMS) represents a significant advance in patient monitoring through the integration of a wide range of functionality into a single, standard Microsoft Windows 2000 ™ professional version based Personal Computer. The YM9000 Central Monitoring System (CMS) combines the features of a central monitor – multi-patient waveform and parameter display, alarm annunciation – with the YM9000 Central Monitoring System (CMS) patient data review of a clinical review station to meet the diverse needs of today's clinical environment.

The YM9000 Central Monitoring System (CMS) also represents advances in monitoring convenience, flexibility, and ease-of-use. Display formats, monitoring controls, alarm response, and patient data presentation are easily configured to suit user preferences and optimize user performance. The YM9000 Central Monitoring System (CMS) will be referred to as the YM9000 CMS throughout this manual.

Intended use

The intended use of the YM9000 CMS is to display physiologic waves, parameters, and trends, format data for strip chart recordings and printings, and provide the annunciation of alarms from other networked medical devices at a centralized location. The YM9000 CMS provides for the retrospective review of alarms, physiologic waves and parameters from its database.

Features

The YM9000 CMS includes a wide range of features that can be easily configured to suit the needs and preferences of specific clinical applications. Access to these features is made with a point-and-click mouse. Simply move the mouse pointer to a labeled application button and click. The button's application is immediately displayed on the screen. A keyboard is also provided for entering and changing patient data and other information. The Center Monitoring System provides real-time waveform monitoring for up to 16 patients being monitored by patient monitor on the system’s Local Area Network (LAN). The standard Center Monitoring System includes the following features:

- The CMS for viewing real-time patient data and annunciation of alarms from bedside patient monitor.
- The CMS can review for up to 48 hours for stored patient monitoring data, waveforms and alarm events.
- Main Screen for displaying real-time waves and parameters for up to 8 or 16 patients and separate Patient Window for viewing detailed real-time or stored data for individual patients.

<YM9000 CMS Window Display Capability>

- Main Screen: Up to 8 beds or up to 16 beds
- Patient Window: selectable monitor, with 4 waveforms shown
- Patient Data Review Window: Trend Review, Wave Review, Alarm Review, bed selectable, data recording, wave selectable, scroll capability, trend scale (time interval) user-selectable, event list, tabular trend list.
- Setup Window: wave setting, position setting, wave sweep speed setting, current monitor settings, date/time setting, patient information, recording setting, and system configuration access.

System Configuration

<YM9000 CMS configuration>

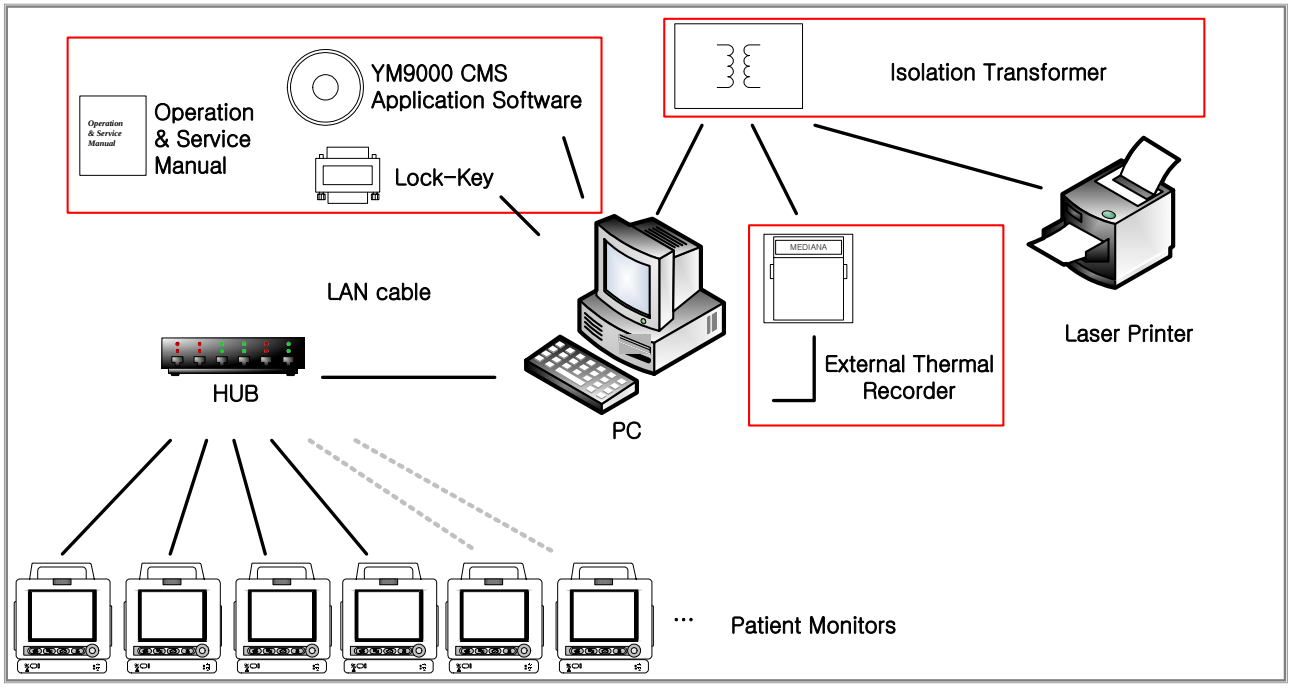

Figure 1. YM9000 CMS Overview

The YM9000 CMS consists of:

- YM9000 CMS application software CD
- Lock-key for Application software
- YM9000 Recorder System (External thermal recorder)
- (Option) Hub (16port) for connecting up to 8 monitors to a single CMS
- (Option) Hub (24port) for connecting up to 16 monitors to a CMS.
- (Option) LAN cables.
- (Option) PC for 8 bed CMS with Windows 2000 professional version
- (minimum Pentium 4 2.0GHz, minimum RAM 512Mbyte, 1280×1024 Graphic Card, External Speaker, Sound card.(Option) PC for 16 bed CMS with Windows 2000 professional version (minimum Xeon 2.4GHz, minimum RAM 1 G byte, 1280×1024 Graphic Card, External Speaker, Sound Card)
- (Option) Isolation Transformer
- (Option) Flat panel PC monitor or CRT monitor (minimum 17 inches)
- (Option) LaserJet printer

SAFETY INFORMATION

Text Conventions

The following conventions for Notes, Cautions, and Warnings are used in this manual.

NOTE **NOTE:** A Note calls attention to an important point in the text

CAUTION: A Caution calls attention to a condition or possible situation that could damage or destroy the product or the user's work.

WARNING: A Warning calls attention to a condition or possible situation that could cause injury to the user and/or patient.

Warnings

WARNING: The PC that supports hyper threading must be turned the function off for proper installation. Set the bios to turn off the hyper threading function before boot. Follow the instructions in the PC manual how to set the bios.

WARNING: Explosion hazard. Do not use the CMS or the bedside monitor in the presence of flammable anesthetics.

WARNING: Electric shock hazard. External covers and panels are to be removed only by qualified service personnel. There are no user-serviceable parts inside.

WARNING: The components of the YM9000 CMS are intended only as an adjunct in patient assessment. The system must be used in conjunction with clinical signs and symptoms.

WARNING: Do not expose any components of the YM9000 CMS to extreme moisture levels such as rain. Such exposure may cause incorrect or inaccurate performance, or device failure during or after exposure.

WARNING: Patient safety could be compromised if the CMS is used as a personal computer while patients are being monitored. The CMS is to be used for patient monitoring only.

WARNING: The YM9000 CMS is intended to monitor patients. It is not a diagnostic device. Any alarm or abnormal indication displayed at the CMS should be reviewed by qualified medical personnel.

WARNING: System default, date, and time settings are selected and set by the system administrator. For optimal patient safety, system default, date, and time settings should be reviewed periodically.

WARNING: know the audible alarm silence duration before temporarily silencing any audible alarm at the CMS. Do not silence audible alarms at the CMS or at the bedside monitor or decrease their volume if patient safety could be compromised.

WARNING: When turning off or restarting the PC, you must follow proper 'shut down' instruction (refer to Operation section). If the PC abnormally shuts down, the YM9000 database may be lost and the system would not perform properly.

Cautions

- **CAUTION: Do not immerse any component of the CMS in liquid or use caustic or abrasive cleaners. Do not spray or pour any liquid on the CMS or its accessories. Do not allow any liquid to come in contact with the power connector, controls, or switches. Do not allow any liquid to penetrate connectors or openings in the chassis.**

- **CAUTION: Do not put the computer inside a cabinet or other closed space where air cannot freely flow around these components.**

- **CAUTION: The CMS is not to be used in mobile environments.**
  Do not use any components of the YM9000 CMS that are damaged.

- **CAUTION: The CMS displays the waveforms and numeric data of the patient monitor. At setup of a bedside monitor with the patient monitor, verify the monitor is set to the desired operation before using the bedside monitor for patient monitoring.**

- **CAUTION: CMS is to be operated by qualified personnel only. Before use, carefully read this manual, all precautionary information, and specifications for the patient monitor and accessories. The user must check that the equipment functions safely and see that it is in proper working condition before being used.**

INSTALLATION

The YM9000 CMS consists of medical software executing on a standard Personal Computer running the Windows 2000™ professional version Operating System.

WARNING: The PC that supports hyper threading must be turned the function off for proper installation. Set the bios to turn off the hyper threading function before boot. Follow the instructions in the PC manual how to set the bios.

WARNING: Installation and setup must be performed by a Mediana service representative or service personnel in user's institute.

CAUTION: The YM9000 CMS is not suitable for installation in the Patient Care Vicinity (Patient Environment).

List of Components

Each YM9000 CMS includes the following standard components:

- YM9000 CMS application software CD
- Lock-key for Application software
- External Thermal Recorder
- Operation & Service Manual

The following optional components are also available:

- HUB (e.g. 16port, 24port)
- Isolation Transformer
- LAN Cable
- PC (e.g. HP Pavilion t112k or Intel Xeon, 2.0GHz with Window 2000 professional version O/S)
- PC Monitor (Size: 17 inch or more, Resolution: 1280×1024)
- Laser Printer (e.g. HP Laser Printer)

NOTE For more information about components and accessories available, refer to the **Specification & Accessories** section and contact your local Mediana sales representative.

NOTE The components of the CMS must comply with electrical safety, reliability and electromagnetic compatibility as intended as a whole system according to the safety and regulatory requirements in the country of use.
The following components for the CMS configuration may be obtained from local suppliers provided that the components conform to electrical safety, reliability and/or electromagnetic compatibility: a personal computer, a laser printer, a HUB, a LAN cable and/or an isolation transformer

NOTE The YM9000 CMS shall be installed on PC supporting resolution of 1280×1024 and 17 inch or more size PC monitor.

Environmental Facility

The environment where the YM9000 CMS will be used should be reasonably free from vibration, dust, corrosive or explosive gases, and extremes of temperature and humidity. If a hardware device is in a cabinet installation, allow sufficient room at the front for operation and sufficient room at the rear for servicing with the cabinet access door open. The YM9000 CMS operates within specifications at ambient temperatures between 15ºC and 40ºC. Allow at least 2 inches (5cm) clearance around the instrument for proper air circulation.

To protect hospital personnel, the cabinets or hardware of the YM9000 CMS must be grounded. Accordingly, the hardware is equipped with detachable 3-wire cables which ground the instrument to the power line ground (protective earth) when plugged into appropriate 3-wire receptacles. If an adequate number of 3-wire receptacles are not available, consult the hospital electrician.

Make sure that during operation, the instrument is free of condensation. Condensation can form when equipment is moved from one building to another, thus being exposed to moisture and differences in temperature.

System Installation

After the YM9000 CMS components have been positioned in their locations, they can be interconnected using proper equipment cables. References for plug connections to the processing unit and references for the total system, including options, are provided. Refer to Figure 1 for connection information.

Central System Setting

Computer

The computer is the primary component of the YM9000 CMS operation. Patient data from the bedside monitors is processed by the computer for display on the monitor. The computer also contains a Lock-key for the YM9000 CMS operation. Refer to the Specification section for computer recommendation.
Connect all the necessary cables into the rear panel of the PC as shown in Figure 2.

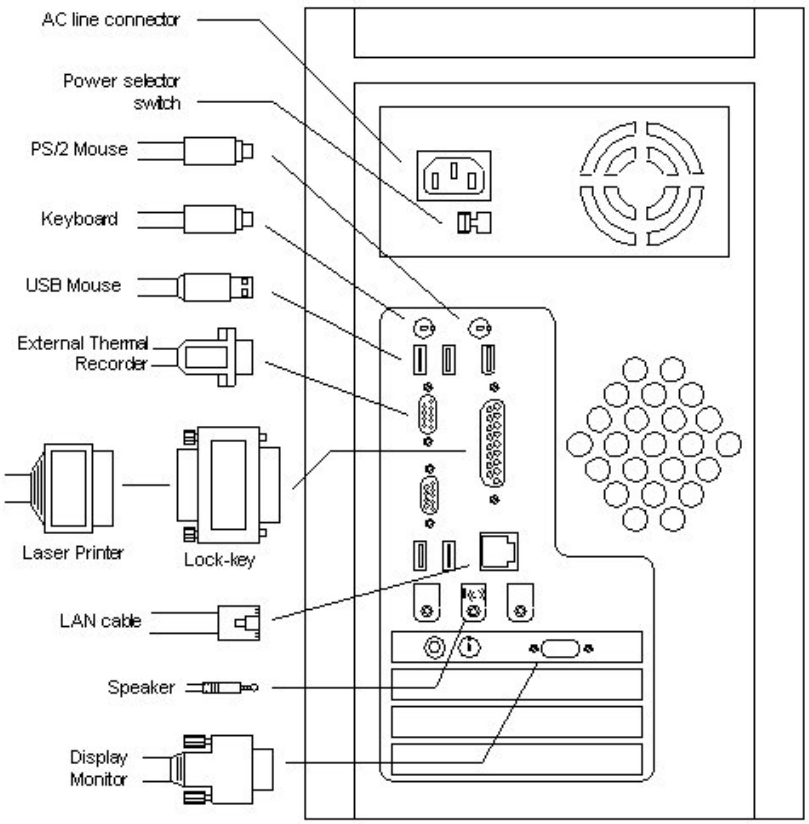

Figure 2. CMS Computer (PC) Settings

Refer to Figure 3. CMS Computer components using the following procedures.

1. Verify that the power selector switch is set to your facility's wall plug voltage.
2. Connect the mouse to the connector (PS/2 or USB) at the back of the computer.
3. Connect the keyboard to the connector at the back of the computer.
4. Connect the other end of the video cable to the video drive connector at the back of the computer.
5. Connect the other end of the serial data cable to the serial port at the back of the computer.
6. Connect the other end of the LAN cable to the Ethernet adaptor at the back of the computer.
7. Connect the Lock-key into the parallel port at the back of the computer and tighten the screws securely.
8. Connect the Laser printer cable to the other side of the Lock-key.

HUB

Network cabling between the PC and the monitors at the bed station provides communications links to the monitors connected to the PC. The Hub is connected to the 10BaseT/100BaseTX Ethernet connection on the rear of the CMS computer. Up to 8 (or optionally 16) patient monitors can be connected.
Plug one end of the LAN cable into any one port of the Hub. Plug the other end of this cable into the RJ-45 connector of the Ethernet adapter in the CMS computer or the Network connector in the patient monitor.
Refer to Figure 3 and 4. Connect the Hub and the device (CMS Computer and Patient monitor) using the following procedures.

1. Connect the DC adaptor to the adaptor jack at the rear panel of the hub.
2. Verify that the power led is lit at the front panel of the hub.
3. Connect the other end of the LAN cable to any one port at the rear panel of the hub.
4. If the other end of the LAN cable is connected to a device that is powered on, verify that the Link/Act led is lit at the front panel of the hub.

The LAN cable length between Hub and connecting the devices (CMS computer and Patient monitor) should not exceed 100 m (328 ft.).

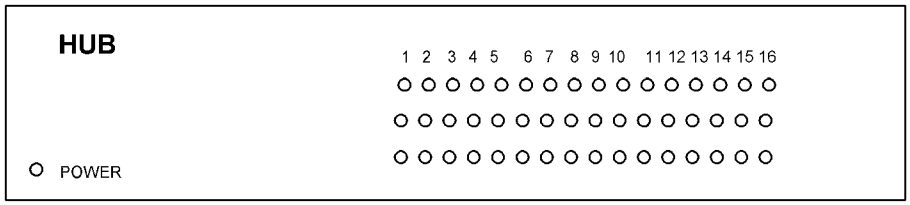

Figure 3. HUB (16 port) Front panel

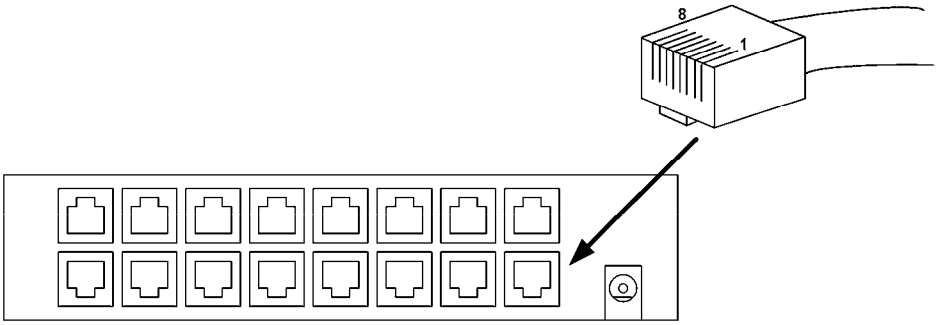

Figure 4. HUB (16 port) Rear panel

Isolation Transformer

An Isolation Transformer is used to provide isolated voltage for the computer, the monitor, an external thermal recorder and a laser printer in order to ensure the safety. Connect each equipment power cord (e.g. the PC, an external thermal recorder and a laser printer) as shown in Figure 5.

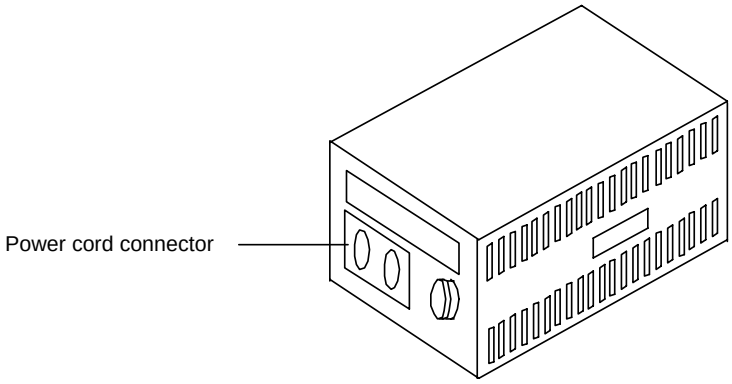

Figure 5. Isolation Transformer Settings

External Thermal Recorder

An optional thermal recorder can be installed in the computer to provide printouts of patient data and system status data. Refer to the rear panel of the external thermal recorder. Connect the RS-232 serial data cable to the connector as shown in Figure 6, then connect the other end of the serial data cable to the PC (serial port COM1). Connect a power cord to AC power through the Isolation transformer.

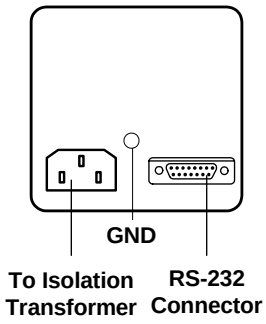

Figure 6. External Thermal Recorder Settings

Laser Printer

An optional laser printer can be connected to the computer to provide printouts of patient data and system status data. The CMS is not supplied with a printer. The printer must be provided by the facility. See the Specifications section for recommendation of a laser printer. For printer operation, refer to the instruction manual for that printer.

Video Card for dual displays (Option)

Dual Display Option provides for additional viewing area. With two displays, the 8 Patient Sectors of the Main Screen appear on the first display, and others 8 Patient Sectors of the Main Screen appear on the second display.

A standard video card is provided in the processing unit for the primary video display. For 16 bed CMS with dual displays, a second video card is required. This is installed in the factory if the dual display option is a purchased option, but must be installed by a Mediana customer engineer if it is an upgrade option.

Beside Station Settings

Connect the LAN cable to LAN connector of the patient monitor, and connect the other side of the cable to the HUB.

The patient monitor's setting for the CMS
You should set the monitor to the CMS via the Set-up menu of the patient monitor.

1. Enter the Set-up Menu of the patient monitor.
2. Select the Service Menu to connect with the CMS, and then enter a bed setting code.
3. Enter an appropriate bed setting code as follows.

Table 1. Bed Setting Codes

BED No.	3-digit setting codes	5-digit setting codes
BED 1	901	77701
BED 2	902	77702
BED 3	903	77703
BED 4	904	77704
BED 5	905	77705
BED 6	906	77706
BED 7	907	77707
BED 8	908	77708
BED 9	909	77709
BED 10	910	77710
BED 11	911	77711
BED 12	912	77712
BED 13	913	77713
BED 14	914	77714
BED 15	915	77715
BED 16	916	77716

NOTE If the bed number is set to '900' or '77700', the connection will be stopped. Set a proper code to the patient monitor.

NOTE CMS bed setting codes should be entered with all digits in order from top to bottom. If not, the monitor will not be set to a proper CMS bed setting code.

4. Then, the patient monitor will display the CMS indicating dot and the bed number on the screen of the patient monitor.
5. When the CMS is on, the CMS indicating dot will appear green. When CMS is off, the CMS indicating dot will appear red.

Software Installation

When the YM9000 CMS arrives at the customer site, all system software should be properly installed and customer purchased functionality fully operational. Therefore, this section can generally be skipped for new installations.
If software functionality is lost, however, either by unexpected electrical conditions or a system failure, this section describes procedures for reinstalling software.
When the Windows 2000 professional version is operational, the YM9000 CMS application software can be installed. This section describes the procedure for installing YM9000 CMS application.

WARNING: The PC that supports hyper threading must be turned the function off for proper installation. Set the bios to turn off the hyper threading function before boot. Follow the instructions in the PC manual how to set the bios.

CAUTION: PC requirements for running the CMS application software:
: 1. Microsoft Windows 2000 professional version installed in PC
2. Microsoft Windows 2000 Service Pack 4 or higher must be installed

Applications Software Installation

The installation procedure is given in the following steps:

1. Insert the YM9000 CMS application software CD into the CD ROM drive of the PC.
2. With the CD ROM inserted, the YM9000 CMS application software can be installed from the Windows 2000 Main Menu.
3. Double click on the My Computer icon in the Windows 2000 Main Menu to bring up the My Computer window.
4. Double click on the CD ROM drive icon to bring up the CD ROM drive window.
5. Click on the Install icon to bring up the Installation of YM9000. Exit all Windows programs before running this setup program.

NOTE You may install the CMS application software with using the “Start” button on the taskbar. Using the "Run" command, type in D:\install and click "OK". (If the drive letter for the CD ROM is other than "D", then substitute the correct drive letter in the Run command; for example, E:\install.)

6. Follow all the procedures to bring up the Setup window as shown in order to complete the application software installation successfully.
7. Click “Next” to install the YM9000 application software program.

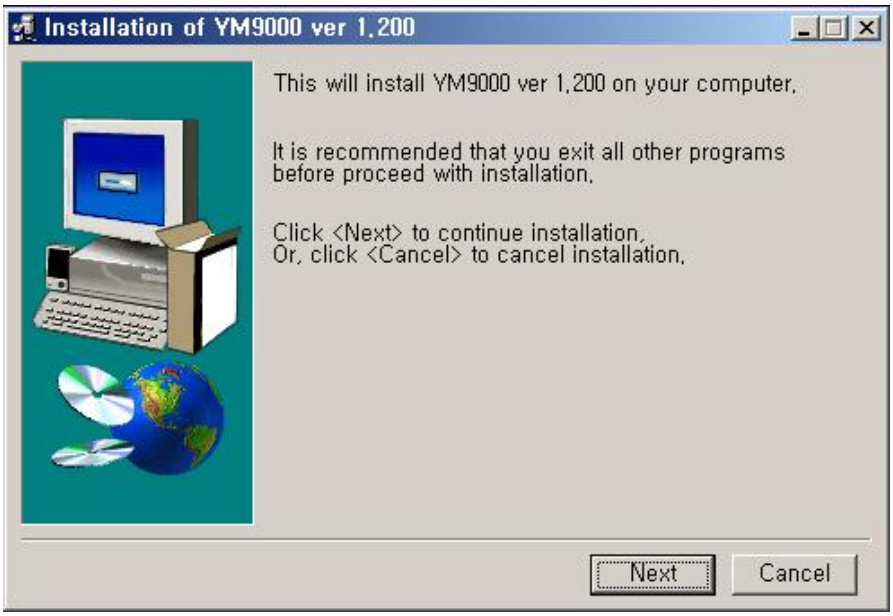
Installation of YM9000 ver 1.200
This will install YM9000 ver 1.200 on your computer.
It is recommended that you exit all other programs before proceed with installation.
Click <Next> to continue installation,
Or, click <Cancel> to cancel installation.
Next
Cancel

Figure 7. Installation Window

8. Click “Browse” to select a desired folder and then click “Install” to begin the installation.

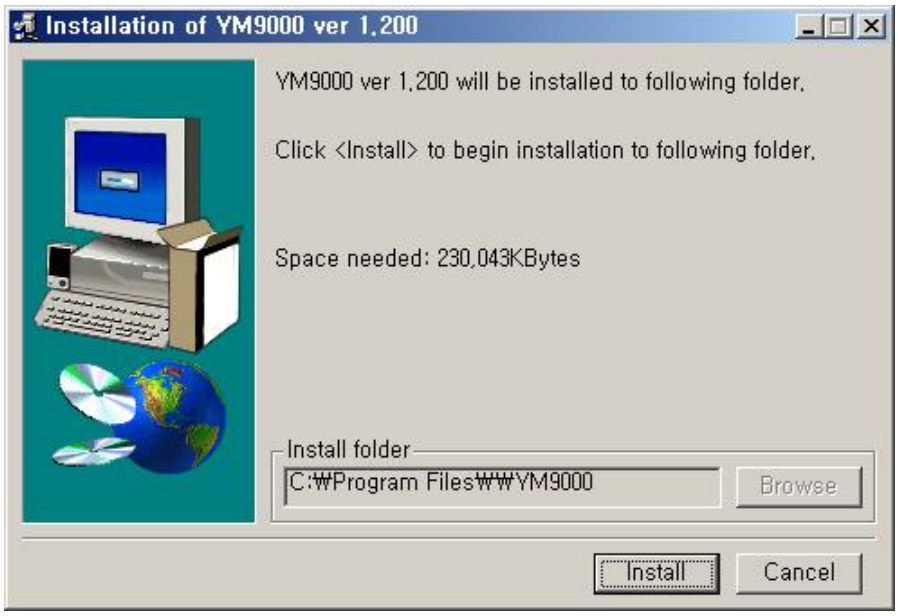

Figure 8. Select Install Folder Window

9. Display windows similar to Figure 9 and Figure 10 will be shown while the software installation is proceeding.

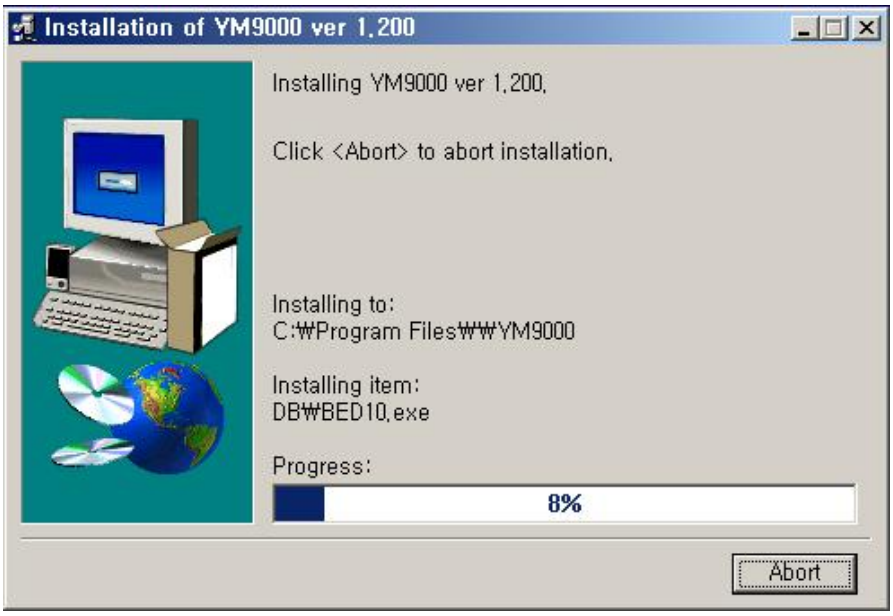

Figure 9. Installation Proceeding Window

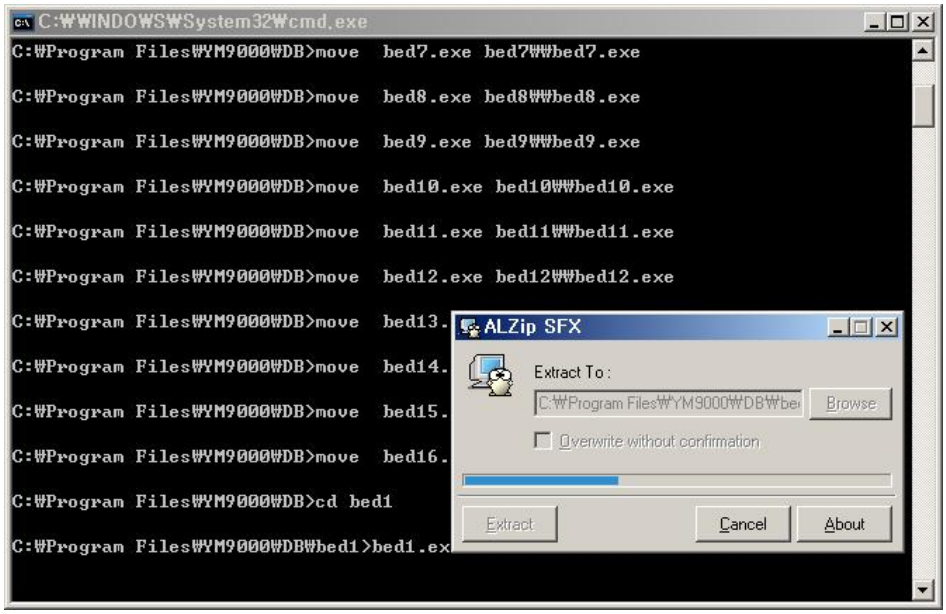

Figure 10. Database Initialization Proceeding Window

10. Click “Install Driver” to install the Lock-key driver.

Figure 11. Lock-key Driver Installation Window

11. Click “Exit” to finish installation of the Lock-key driver after the driver installed successfully.

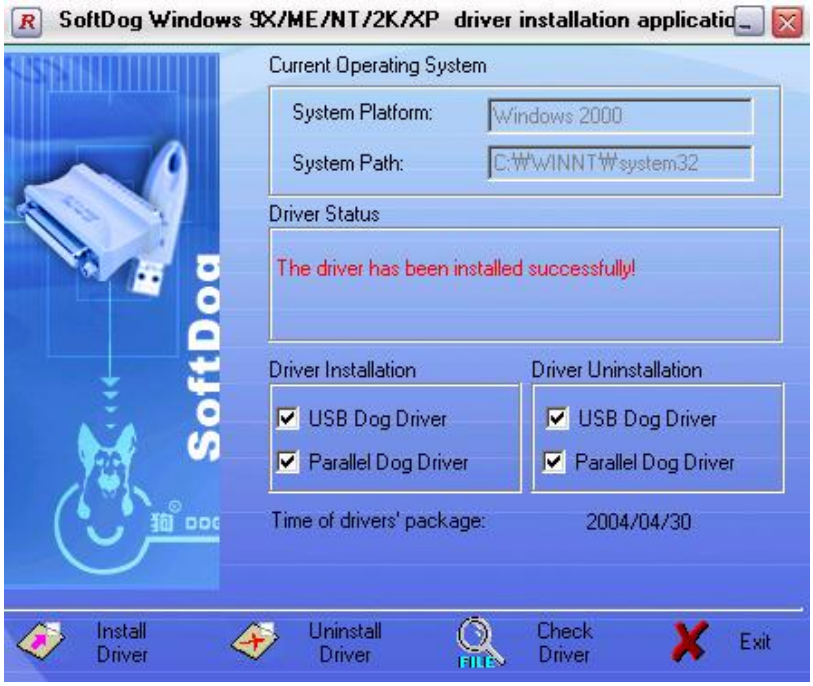

Figure 12. Lock-key Driver Installation Complete Window

12. This is End User License Agreement of MS data access components. Check the box, and then click “Next”.

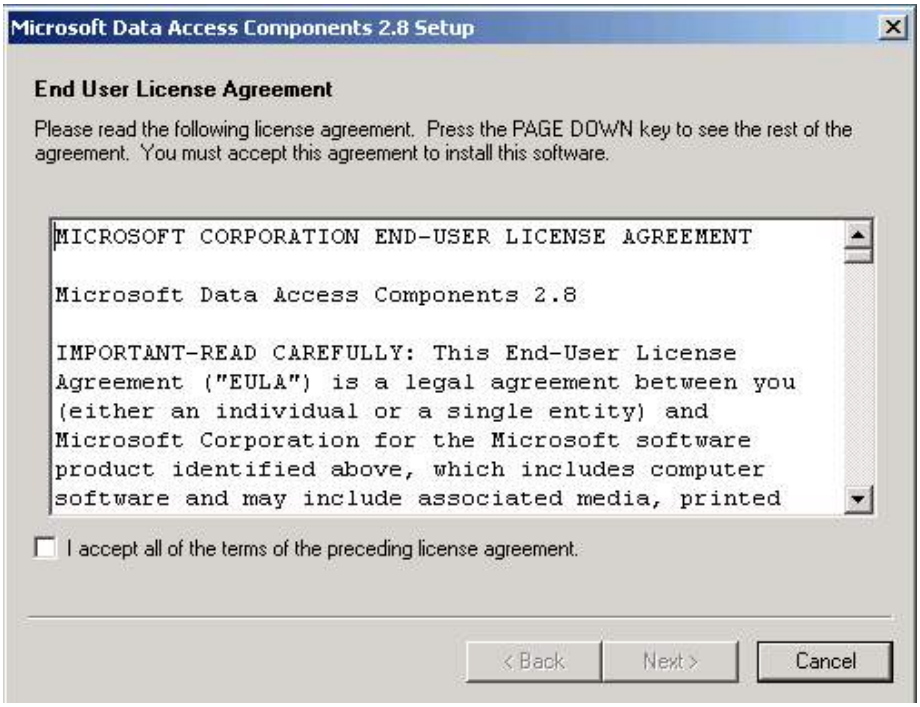
Microsoft Data Access Components 2.8 Setup
End User License Agreement
Please read the following license agreement. Press the PAGE DOWN key to see the rest of the agreement. You must accept this agreement to install this software.
MICROSOFT CORPORATION END-USER LICENSE AGREEMENT
Microsoft Data Access Components 2.8
IMPORTANT-READ CAREFULLY: This End-User License Agreement ("EULA") is a legal agreement between you (either an individual or a single entity) and Microsoft Corporation for the Microsoft software product identified above, which includes computer software and may include associated media, printed
I accept all of the terms of the preceding license agreement.
< Back
Next >
Cancel

Figure 13. Data Access Components License Agreement Window

13. Click “Finish” to begin the installation of MS data access components.

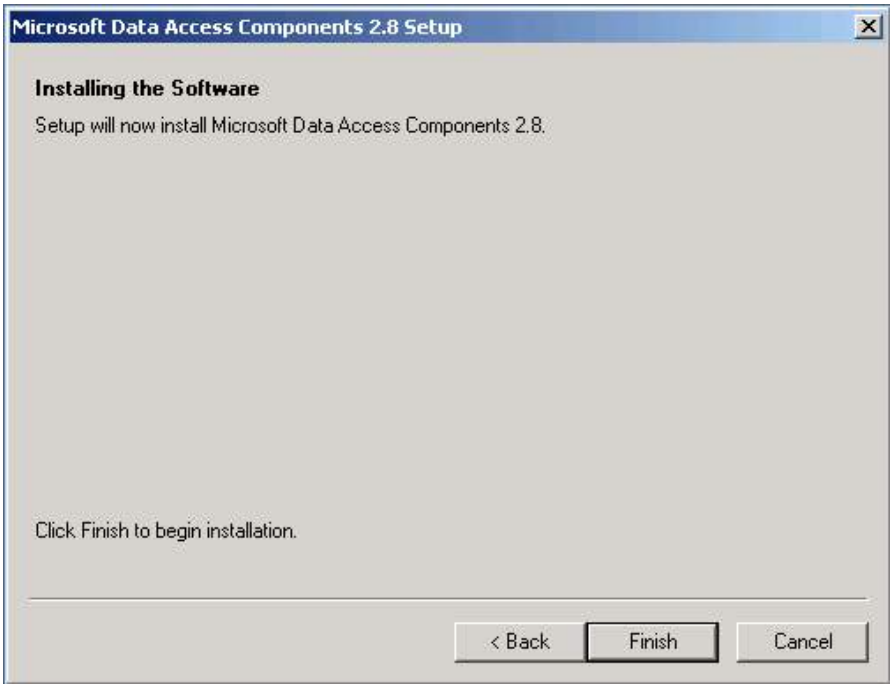

Figure 14. MS Data Access Components Install Window

14. Click “Close” to complete the installation of MS data access components.

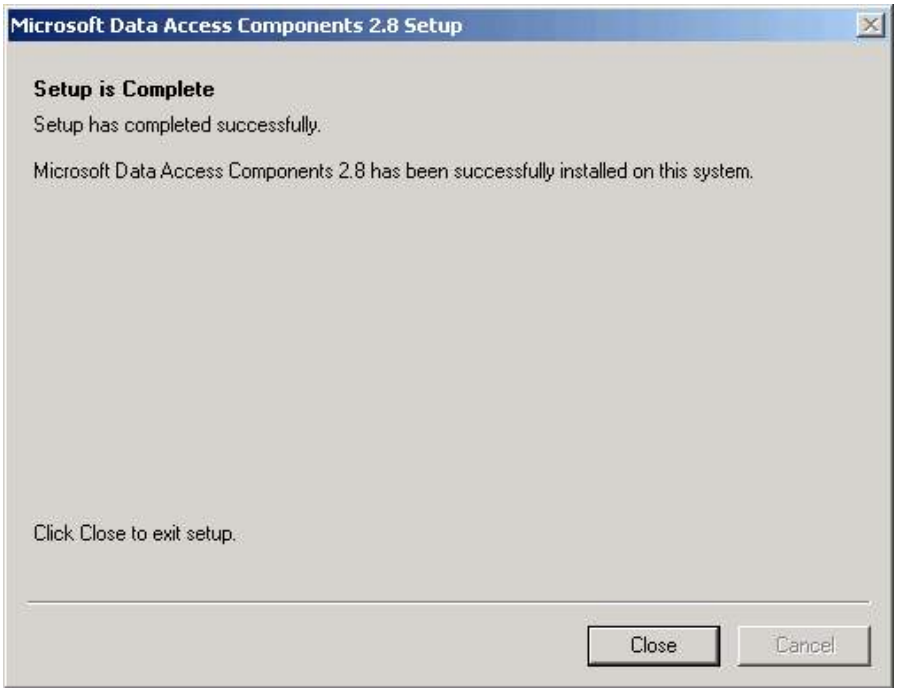
Microsoft Data Access Components 2.8 Setup
Setup is Complete
Setup has completed successfully.
Microsoft Data Access Components 2.8 has been successfully installed on this system.
Click Close to exit setup.
Close
Cancel

Figure 15. MS Data Access Components Install Window

15. After the software installation process is completed, the “Restart" window appears. Click “Yes (Y)” to complete the software installation successfully.

Figure 16. System Restart Window

CAUTION: After CMS installation is completed in the CMS, turn off the bedside monitor monitors. Then turn on every monitor one by one, while making sure that the connection is valid in CMS.

16. After the system is restarted, the “Installation complete” window appears to indicate the “Installation of YM9000 application software completed” message. After the “Installation complete” window appears, the entire YM9000 CMS application software installation is finished.

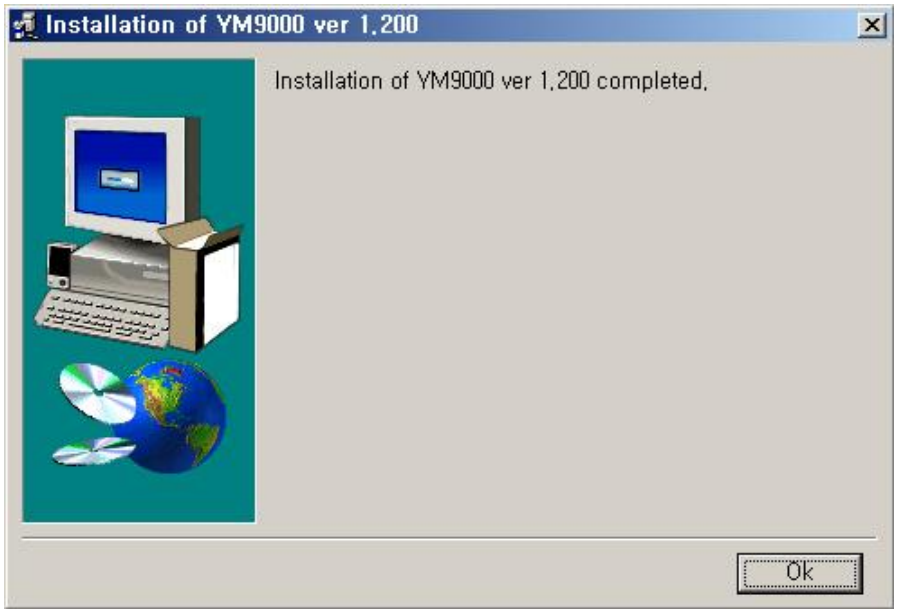

Figure 17. Installation Complete Window

17. When the software installation process is complete, the Installation of “Data access objects” window appears to indicate “Installation of Data access objects (DAO)” for the YM9000 CMS application.

Setup
Setup is preparing the InstallShield Wizard which will guide you through the application setup process. Please wait.
90 %

Figure 18. Installation of “Data access objects” Window

NOTE After the YM9000 CMS application software installation is finished, the IP address and the DNS server address are automatically set.

Initial Installation

Initial Installation must proceed after the program has been successfully installed.

NOTE You must click “Initial Installation” when you first install monitors or add additional monitors, or replace monitors.

1. Self-Test is a test that verifies the YM9000 system itself. If the test routines are successfully completed, the PC displays messages as shown in Figure 19. In order to complete the Initial Installation, Click “Next”.

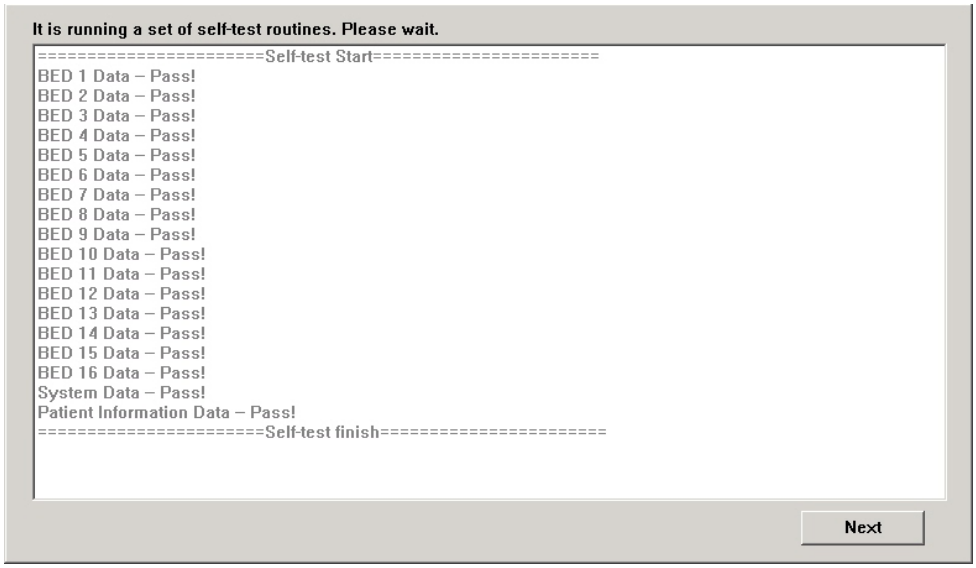
It is running a set of self-test routines. Please wait.
==========Self-test Start==========
BED 1 Data – Pass!
BED 2 Data – Pass!
BED 3 Data – Pass!
BED 4 Data – Pass!
BED 5 Data – Pass!
BED 6 Data – Pass!
BED 7 Data – Pass!
BED 8 Data – Pass!
BED 9 Data – Pass!
BED 10 Data – Pass!
BED 11 Data – Pass!
BED 12 Data – Pass!
BED 13 Data – Pass!
BED 14 Data – Pass!
BED 15 Data – Pass!
BED 16 Data – Pass!
System Data – Pass!
Patient Information Data – Pass!
==========Self-test finish==========
Next

Figure 19. Self-Test Finish Display

2. It displays as shown in Figure 20. Click “Initial Installation”.

Figure 20. Program Initial Display

3. Enter a password (mn1018) to proceed with Initial Installation. Then click “OK”.

YM9000
Password
You are about to enter the Initial Installation of this Central Monitor product! This mode should ONLY be used by trained support personnel. Activation of these programs may affect the operation of your Central Monitor.
Enter Password
OK
Cancel
16 Beds with dual displays
Initial Installation
MEDIANA
VENTURE ENTERPRISE

Figure 21. Password Window for Initial Installation

4. Check if the number of between the bedside monitors listed and the bedside monitors installed is equal. If it is equal, click “OK” to proceed with initial setting. After successful completion of the initial setting, click “OK” to display Initial Display.

YM9000
Dialog
Number of Bedside Stations
Refresh
1 — [048249071194]
2 — [048249065101]
2 Bedside Station detected...
Does the number of bedside stations listed above equal the number of ones installed?
OK
Exit
Note
If the number of bedside stations does not equal, click on "Refresh" button. If it still does not equal, check the connection of a network cable or power supply of the installed bedside stations.
Bed
a single display
dual displays
Installation
MEDIANA
VENTURE ENTERPRISE

Figure 22. Initial Installation Window

NOTE If the number of bedside monitors listed and bedside monitors installed is not equal, click “Refresh”. If it still is not equal, check the connection of the power supply, and the network line of the installed bedside monitors.

5. With the completion of Initial Installation, all necessary installation procedures of YM9000 are finished and it displays as shown Figure 22. Click the button that indicates the proper number of bedside monitors installed. The program will automatically run.

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OPERATION

In the typical operation of the YM9000 CMS, you will primarily use any one of the following CMS operating screens: the Main screen, the Patient window, the Trend review screen, the Alarm review screen, the Wave review screen. A general description of each of these screens is provided in the *Operation* section.

Start-up

WARNING: Patient safety could be compromised if the YM9000 CMS is used for other personal computer applications. The YM9000 CMS is to be used for patient monitoring only.

WARNING: Explosion hazard. Do not use the YM9000 CMS or the patient monitor bedside monitor monitors in the presence of flammable anesthetics.

To turn on the YM9000 CMS, press the power switch on the YM9000 CMS computer. The YM9000 CMS is loaded automatically.

After it is turned on, the PC monitor automatically runs a set of self-test routines. If the test routines are successfully completed, the PC displays messages as shown in Figure 23. Self-Test is a test that verifies the YM9000 system itself. For example, it detects and recovers database errors. After Self-Test is finished, click “Next” to display the normal initial screen. If an error is detected, it will automatically recover the database. Then click “Next” to display the normal initial screen.

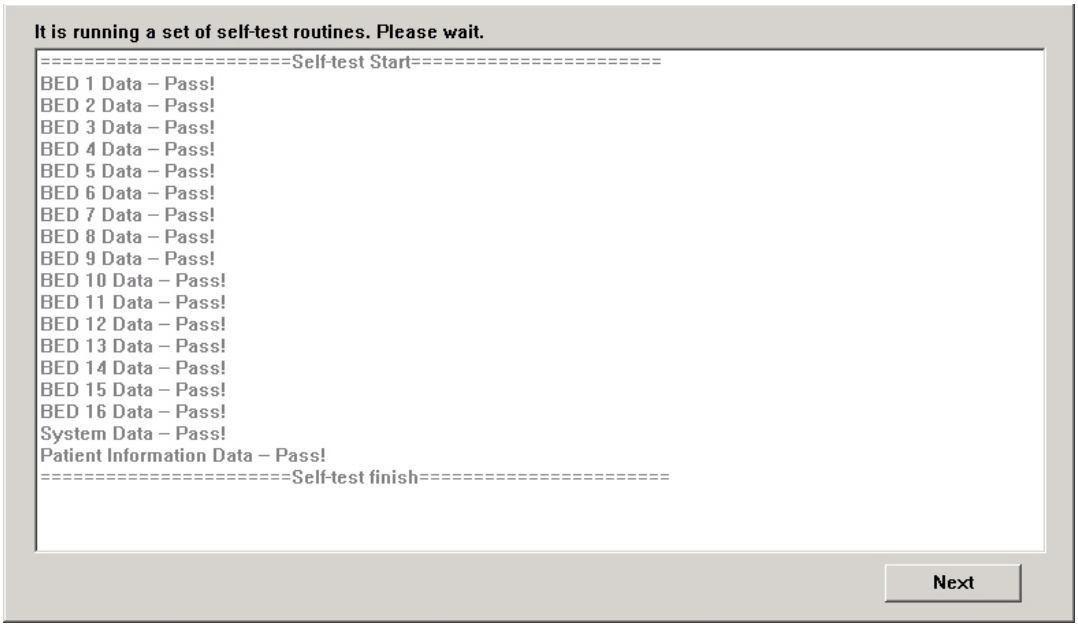

It is running a set of self-test routines. Please wait.
==========Self-test Start==========
BED 1 Data – Pass!
BED 2 Data – Pass!
BED 3 Data – Pass!
BED 4 Data – Pass!
BED 5 Data – Pass!
BED 6 Data – Pass!
BED 7 Data – Pass!
BED 8 Data – Pass!
BED 9 Data – Pass!
BED 10 Data – Pass!
BED 11 Data – Pass!
BED 12 Data – Pass!
BED 13 Data – Pass!
BED 14 Data – Pass!
BED 15 Data – Pass!
BED 16 Data – Pass!
System Data – Pass!
Patient Information Data – Pass!
==========Self-test finish==========
Next

Figure 23. Self-Test Finish Display

Normal initial screen, Figure 24 shows “bed-selection” buttons. You may click one of the buttons to correspond with your CMS options (8 or 16 beds with a single display, and 16 beds with dual displays).

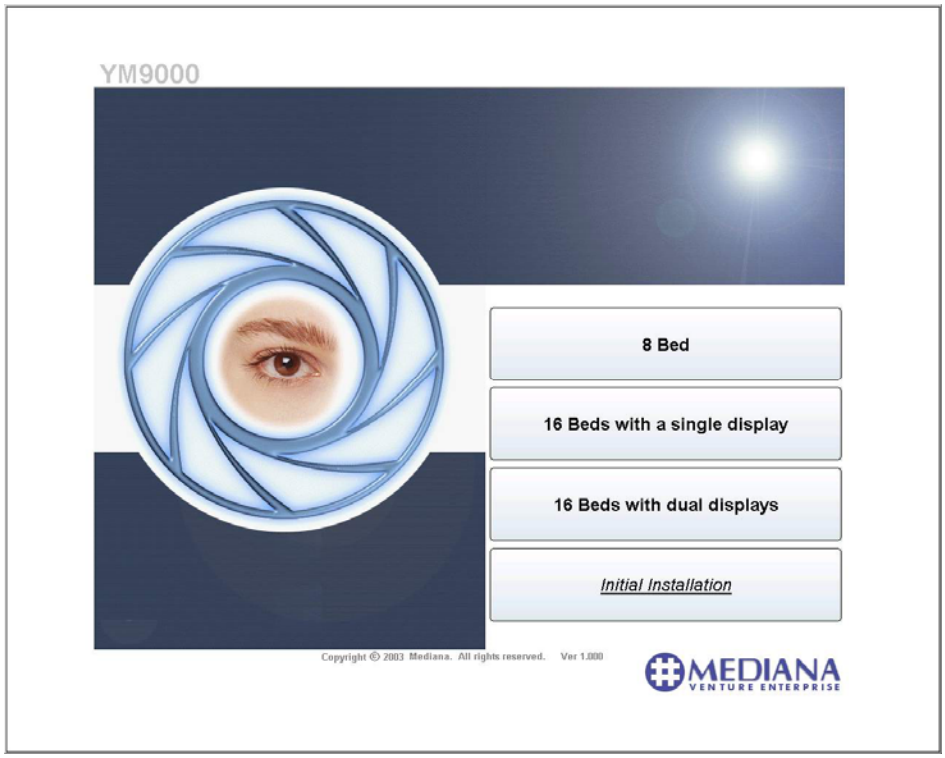


Figure 24. Program Initial Display

Then the PC monitor displays the typical Main screen.

Main Screen

The Main Screen of the CMS is the primary patient monitoring screen. All bedside monitor monitors that the CMS has established communication with are displayed on the Main screen. It can display up to 8 patients (optional 16 patients) and 2 waves per patient with a maximum of 16 waves per screen (32 waves with dual displays). Each of these bedside monitor monitors presents a patient sector with a label which includes the bed number on the Main screen.

When the YM9000 operates in 16 bed monitoring with a single display, only the Alarm button is shown in the Main screen. When you click the Alarm button, then all patient sector buttons appear in the Main screen.

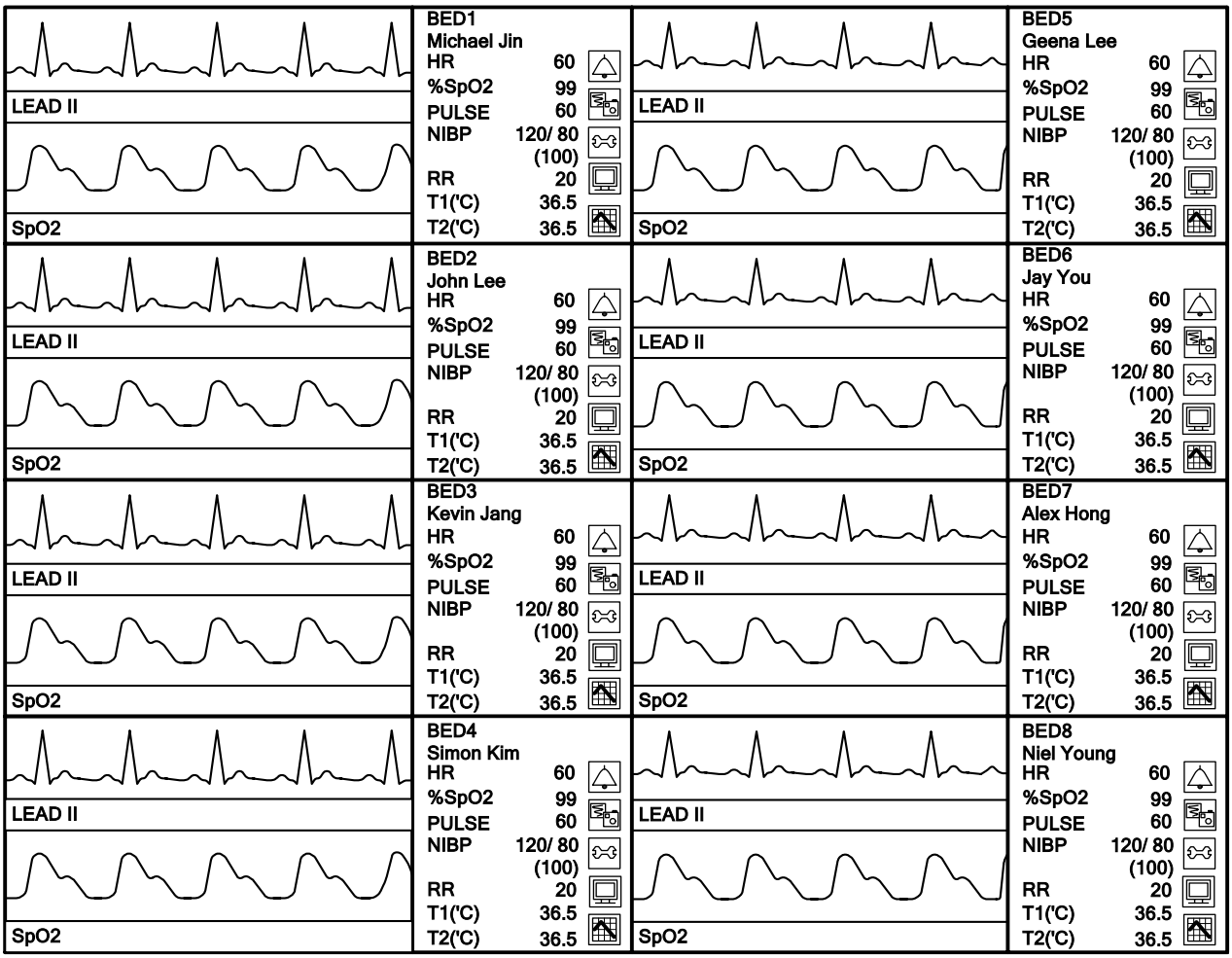


Figure 25. Main Screen Display

Display Configuration

Patient data (waveforms and numeric data) can also be color coded for easy identification. Colors for waves and parameters are the same as those colors from the patient monitor. Patient Sectors in alarm are also highlighted in color for immediate recognition of alarm conditions and their severity. Patient data color identification is shown in Table 2.

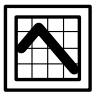
Table 2. Display Color Identification

Function	Color
ECG/Heart Rate	Green
SpO_2	Cyan
NIBP	Orange
Respiratory	Yellow
Temperature	Light Blue
General Background	Black
Low Priority Alarm	Yellow
Medium Priority Alarm	Flashing Yellow
High Priority Alarm	Flashing Red

Symbols and Controls

There are 5 buttons available to you from the patient sector.

Table 3. YM9000 CMS Controls

Buttons	Description
	Alarm button temporarily silences the audible alarm. Indicates Alarm Silence or Suspended status
	Record button records patient's data through the recorder. 10(or 20 or 30) second one-shot recording.
	Setup Window button displays Setup Window (see Figure 26)
	Patient Window button displays Patient Window (see Figure 33).
	**Patient Data Review button** displays trend data in 3 reviews: patient trend, wave, and alarm. (see Figure 34, 36 and 37)

Setup Window

When the mouse pointer is in the sector on the main screen, the sector is outlined. Click the Setup window button of the patient you want to display on the setup window.
The setup window is used to select the wave that displays on the main screen, place the Patient Sector in another position on the display, or select sweep speed. This window is also used for checking the monitor status, current date/time and patient information. This window also provides access to other windows for setting system configuration and patient management.

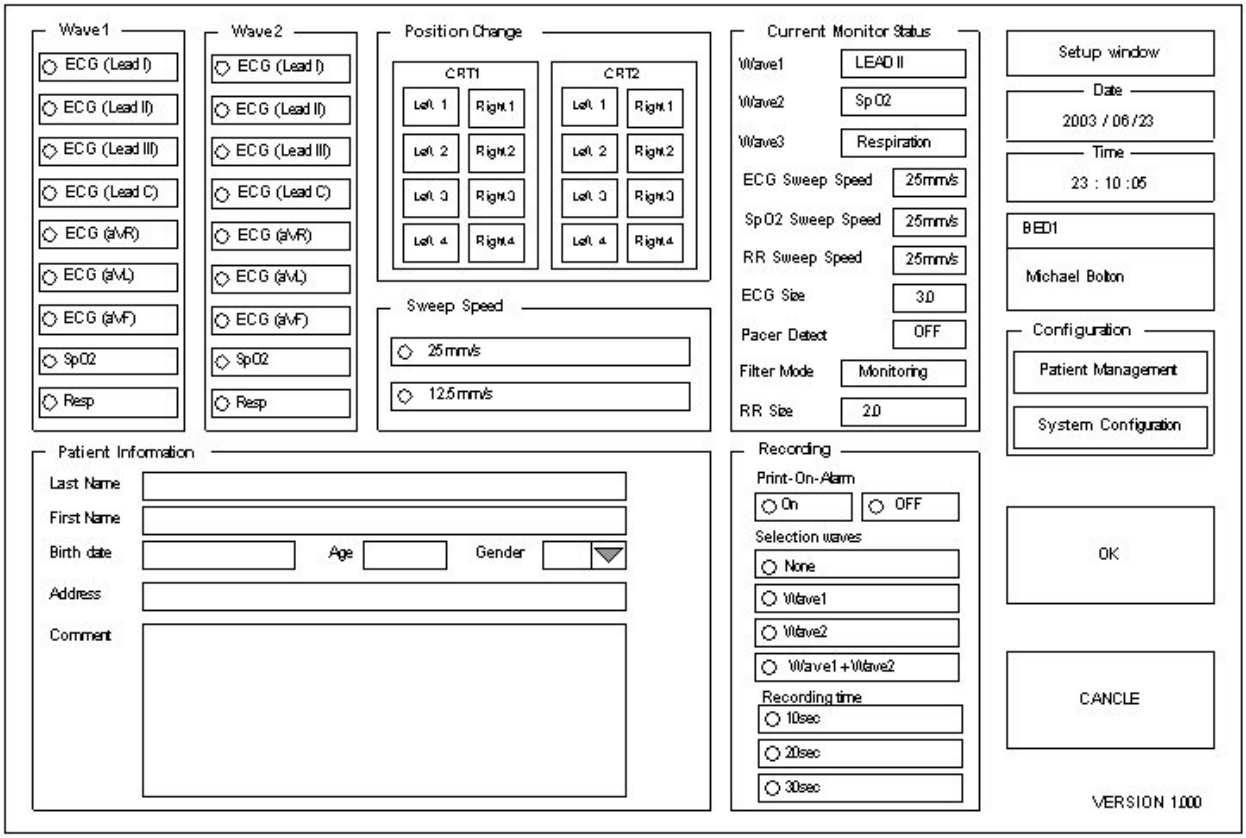


Figure 26. Setup Window Display

Wave Settings

Wave 1, 2 setting menus allow you to select waves to be displayed. Each 9 waves can be selected as shown in Figure 26. If the same waves are selected in wave 1 and wave 2 sectors, it will display a cascaded wave.

NOTE When 3 lead ECG is measuring in the patient monitor, you should not select ECG Lead C, aVR, aVL, aVF in the Wave 1, 2 settings.

Position Change

The Position Change menu allows you to place the Patient Sector in another position on the display.

1. The current position button appears as if it has been pressed down in the position change menu.
2. Click another position button where you want to display the Patient sector on the main screen.
3. If you click a position that is already in use, the position button is not selected.
   In this case, click another position button.

Sweep Speed

In this menu, you can select the sweep speed (25mm/s or 12.5mm/s) of the waves to be displayed.

Current Monitor Status

Current Monitor Status shows the current settings of the patient monitor.

Patient Information

Patient information shows the patient name, birth date, age, gender, address and comments.
You can change patient information in the Patient management menu.

Recording Settings

Recording setting menu allows you to set recorder options.

Print-On-Alarm:
If set to "On", this causes the recorder to print automatically when an alarm occurs.
Each time a high or medium priority alarm condition occurs, a 10 (or 20 or 30) second One-Shot printout is made automatically.

Selection Waves:
This menu allows you to selects waves to be recorded when you click the Record button.

Selection Recording Time:
This menu allows you to select recording time to printout when you click the Record button.

Configuration

PATIENT MANAGEMENT

This allows a clinician to enter or change patient information.
When a patient is to be monitored at the CMS, patient data must be entered. Patient discharge and transfer are also accomplished using the patient management window. If patient data needs to be changed, use the same procedures as when admitting the patient.

CAUTION: The Patient management service password is mn7306. It should ONLY be released to authorized personnel.

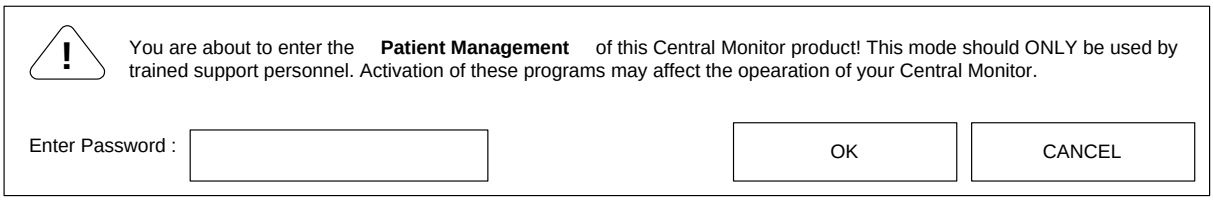

You are about to enter the Patient Management of this Central Monitor product! This mode should ONLY be used by trained support personnel. Activation of these programs may affect the opearation of your Central Monitor.
Enter Password :
OK
CANCEL

Figure 27. Patient Management Access Window Display

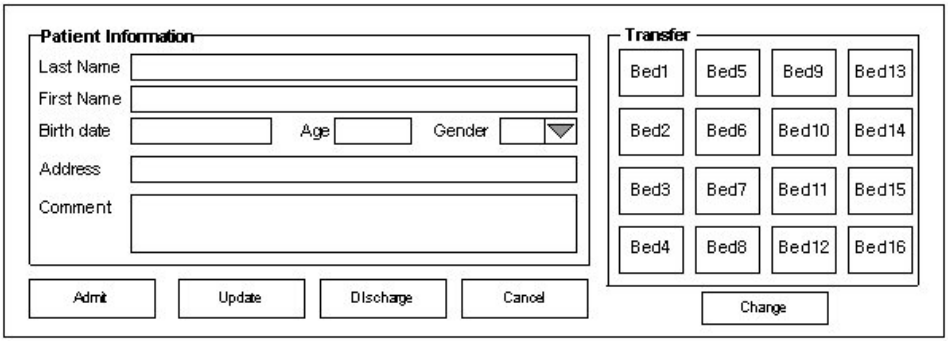


Figure 28. Patient Management Window Display

Admitting a patient

You must admit a patient to the YM9000 CMS in order for the name to appear on the display, recordings, or reports. You admit a patient by using the Patient Management Window.

1. Click the Setup button to display the Patient setup window.
2. If you select Patient Management, the Prompt Access Message Window will display.
3. Enter the password, then click "OK" button (see Figure 27). The Patient Management Window will display (see Figure 28). You may now enter or change patient information (such as name, age, gender, and address,).
4. To admit a patient, enter patient information (name, age, gender, address, and etc).
5. Click "Admit" button.

NOTE Click Cancel to quit and make no changes the patient information.

Changing patient data

1. Click the Setup button to display the Patient setup window.
2. If you select Patient Management, the Prompt Access Message Window will display.
3. Enter the password, then click "OK" button (see Figure 27). The Patient Management Window will display (see Figure 28)
4. Now you can enter or change patient information (such as name, age, gender, address).
5. Make changes as desired.
6. Click "Update" button.

NOTE Click Cancel to quit and make no changes the patient information.

Discharging a patient

Since data collection starts when a patient is admitted to the CMS, it is very important to perform a discharge prior to admitting a new patient. This ensures that data from a previous patient is not mixed with the data from the new patient.

1. Click the Setup button to display the Patient setup window.
2. If you select Patient Management, the Prompt Access Message Window will display.
3. Enter the password, then click "OK" button. (see Figure 27) The Patient Management Window will display. (see Figure 28) Now you are ready to discharge a patient.
4. Discharge patient and patient information (name, age, gender, address, and etc).
5. Click "Discharge" button.

WARNING: When the Discharge function is initiated at the CMS, all patient information and all trend data for the patient stored in the CMS is permanently deleted.

Transferring a patient to a different bed

1. Click the Setup button to display the Patient setup window.
2. If you select Patient Management, the Prompt Access Message Window will display.
3. Enter the password, then click "OK" button (see Figure 27). The Patient Management Window will display (see Figure 28). Now you are ready to transfer patient information (name, age, gender, address, and etc).
4. If a patient needs to move, click a desired bed position through Transfer.

NOTE The bed into which the patient is being transferred must have had the discharge function performed on it and the CMS should not be receiving data from the bedside monitor.

5. Click "Change" button.

NOTE Click Cancel to quit and do not transfer a patient.

NOTE If the patient transfer from one monitor to another is required, both of the bedside monitors must be restarted after changing a patient transfer is set to the CMS. For example, if a patient needs transferring from Bed 1 to Bed 3, both Bed 1 and Bed 3 must be turned off after choosing Bed 3 and clicking the "Change" button.

SYSTEM CONFIGURATION

Only a trained clinician should be allowed to change CMS settings.

CAUTION: The System Configuration service password is mn1123. It should ONLY be released to authorized personnel.

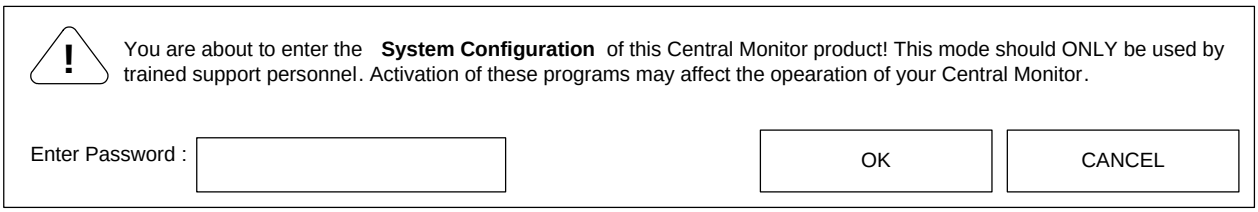

You are about to enter the System Configuration of this Central Monitor product! This mode should ONLY be used by trained support personnel. Activation of these programs may affect the opearation of your Central Monitor.
Enter Password :
OK
CANCEL

Figure 29. System Configuration Access Window Display

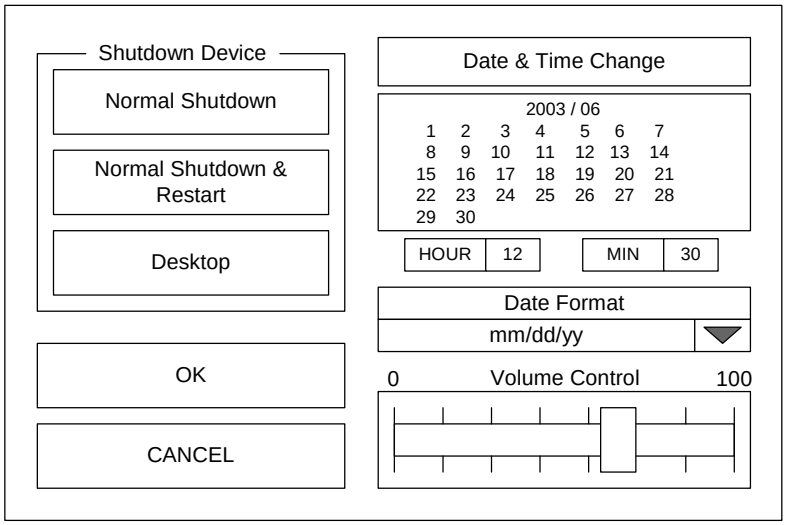


Figure 30. System Configuration Window Display

Setting System Alarm Volume levels

System Alarm Volume can be changed by using a scroll bar in the System configuration window.

1. If you select System Configuration, the Prompt Access Message Window will display.
2. Enter the password, then click “OK” button. (see Figure 29)
3. The System Configuration Window will display. (see Figure 30)
4. Click the volume setting slider and drag the level indicator to obtain the desired volume level.
5. Click “OK” button.

CAUTION: If the Audible volume of the CMS is set to “0”, an alarm suspend symbol is always be displayed on the CMS screen.

Setting System Date and time

You can set a desired date format (mm/dd/yy, dd/mm/yy or yy/mm/dd) and change current date/time.

WARNING: If the time and date are set forward or backward by more than 1 minute, the YM9000 CMS will automatically reflect the new time and there will be loss of data for the period of time that the time was set forward or backward.

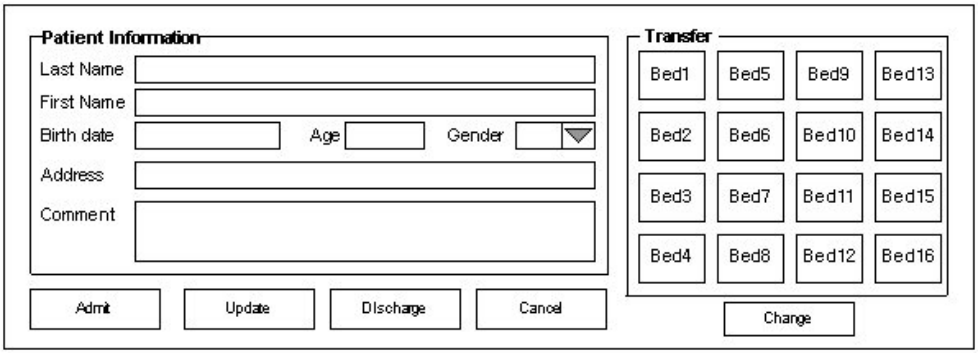


Figure 31. Date/Time Message Display

1. If you select System Configuration, the Prompt Access Message Window will display.
2. Enter the password, then click “OK” button. (see Figure 29)
3. The System Configuration Window will display. (see Figure 30)
4. Click Data Format sidebar. Then you can set a desired date format (mm/dd/yy, dd/mm/yy or yy/mm/dd).
5. Click Month, Day, Year, Hour and Minute field to set the current date/time.
6. Click Date & Time Change button.
7. After the Warning message window displays, click “OK” button. (see Figure 31)

NOTE Click OK to save changes you have made or click No to quit and make no change to the data and time in the warning message window.

Shutdown

System configuration menu provides controls for shutting CMS and Windows 2000 software down, and for accessing the Windows 2000 main menu.

WARNING: Patient safety could be compromised if the Shutdown function is used while patients are being monitored. While patient monitoring continues at the bedside monitors, the Shutdown function stops all display of bedside monitor status and alarms at the CMS. The Shutdown function should only be used by the system administrator or other qualified personnel, and only when patient safety will not be compromised.

1. If you select System Configuration, the Prompt Access Message Window will display.
2. Enter the password, then click “OK” button. (see Figure 29)
3. System Configuration Window will display. (see Figure 30)
4. Click one of the “Shutdown device” buttons to shutdown.

- Normal Shutdown:

Normal shutdown shuts the YM9000 system down normally and prepares it to be turned off. Windows 2000 messages follow describing the shutdown condition.

- Normal Shutdown & Restart:
Normal shutdown and Restart shuts the YM9000 system down normally and automatically restarts system software to bring up all YM9000 applications and all stored patient data.

- Desktop:
Desktop shuts down the YM9000 system and brings up the Windows 2000 Desktop main menu. A complete reboot of the computer is required to bring up YM9000 application software and return to central monitoring.

5. Shutdown/Restart message window will display, then click “OK” button. (see Figure 32)

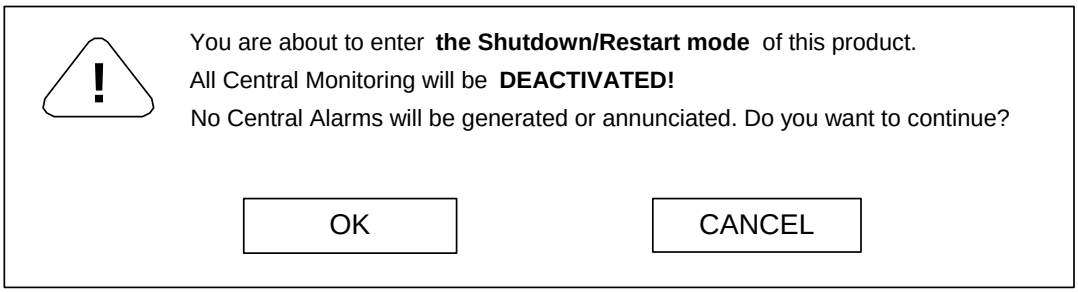

You are about to enter the Shutdown/Restart mode of this product.
All Central Monitoring will be DEACTIVATED!
No Central Alarms will be generated or annunciated. Do you want to continue?
OK
CANCEL

Figure 32. Shutdown/Restart Message Display

CAUTION: When running the CMS program after rebooting the PC, it may take a few minutes to connect the CMS to the bedside monitors. Also, this connecting/disconnecting may repeat 1 or 2 times when CMS program does not install initial setup. However, this is normal while the program is checking the related database.

Patient Window

Additional data for each patient can be obtained in a more detailed Patient Window. Clicking on the Patient Window button in the Main screen brings up the Patient Window for that patient.

For 8 beds monitoring with a single display or 16 beds monitoring with dual displays, all patient sectors resize to display wave 1, partial patient data, and 2 buttons (Alarm, Recorder) available as shown in Figure 33.
For 16 beds monitoring with a single display, the upper 8 bed patient sectors display wave 1, partial patient data and 1button (Alarm). The lower 8 bed patient sectors are erased to display the patient window.

The Patient Window can display up to 4 waves and all patient numeric data for a single patient. Buttons for accessing additional information and changing monitoring parameters are also provided at the bottom of the Patient Window.

- If you would like to select waves and set sweep speed, click the Setup button.
- To remove the application window, click the Main Screen button.
- If you would like to review patient's trend data, click .the Trend review button.

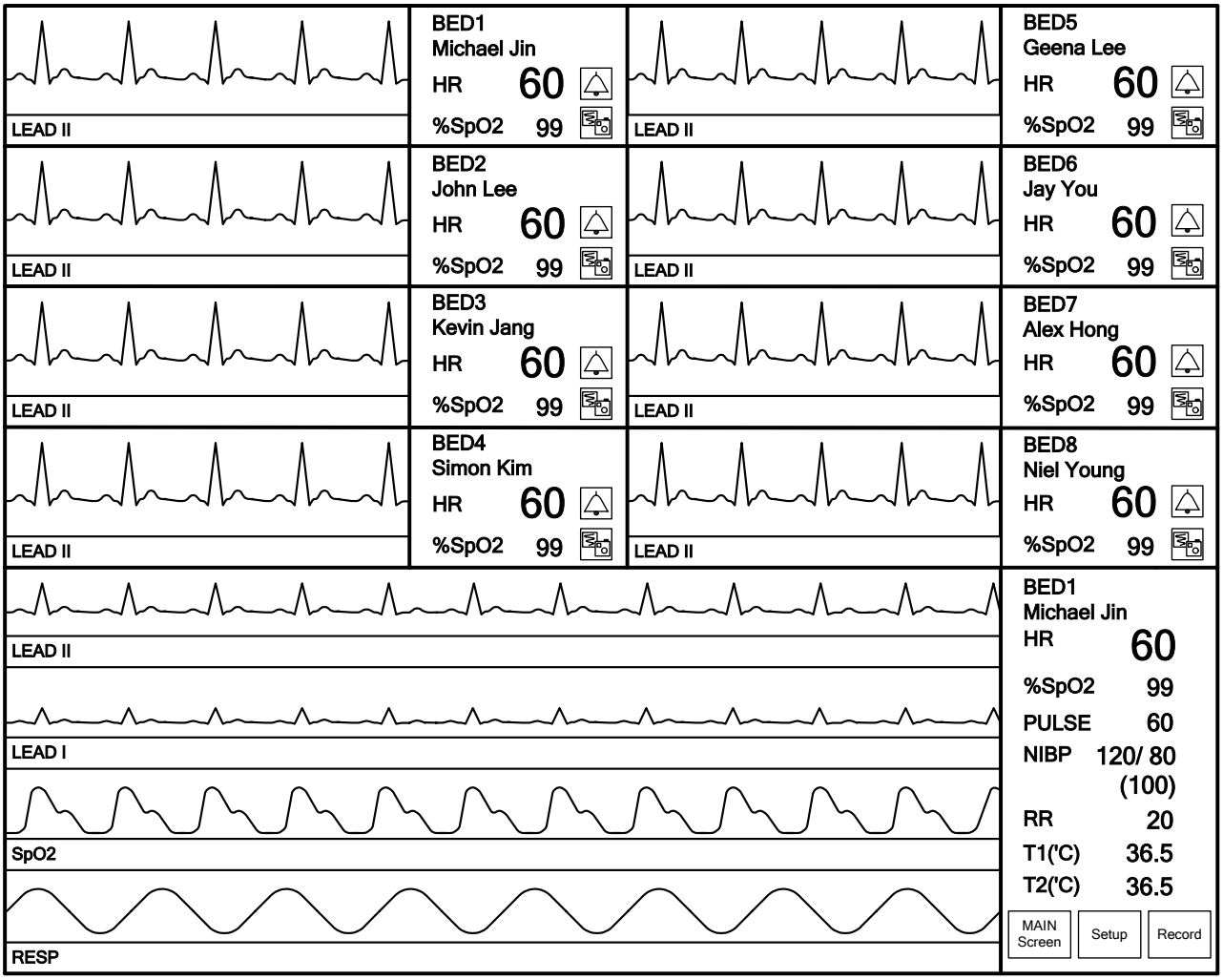


Figure 33. Patient Window Display

Patient Data Review Window

Patient data storage begins when the patient is connected to a bedside monitor. The YM9000 CMS provides review windows that allow you to display a patient's physiological parameters and alarm events that have been collected from a bedside monitor and stored over time in the System.
In the Main screen, click the Patient data button to display the Trend review window.

Trend Review

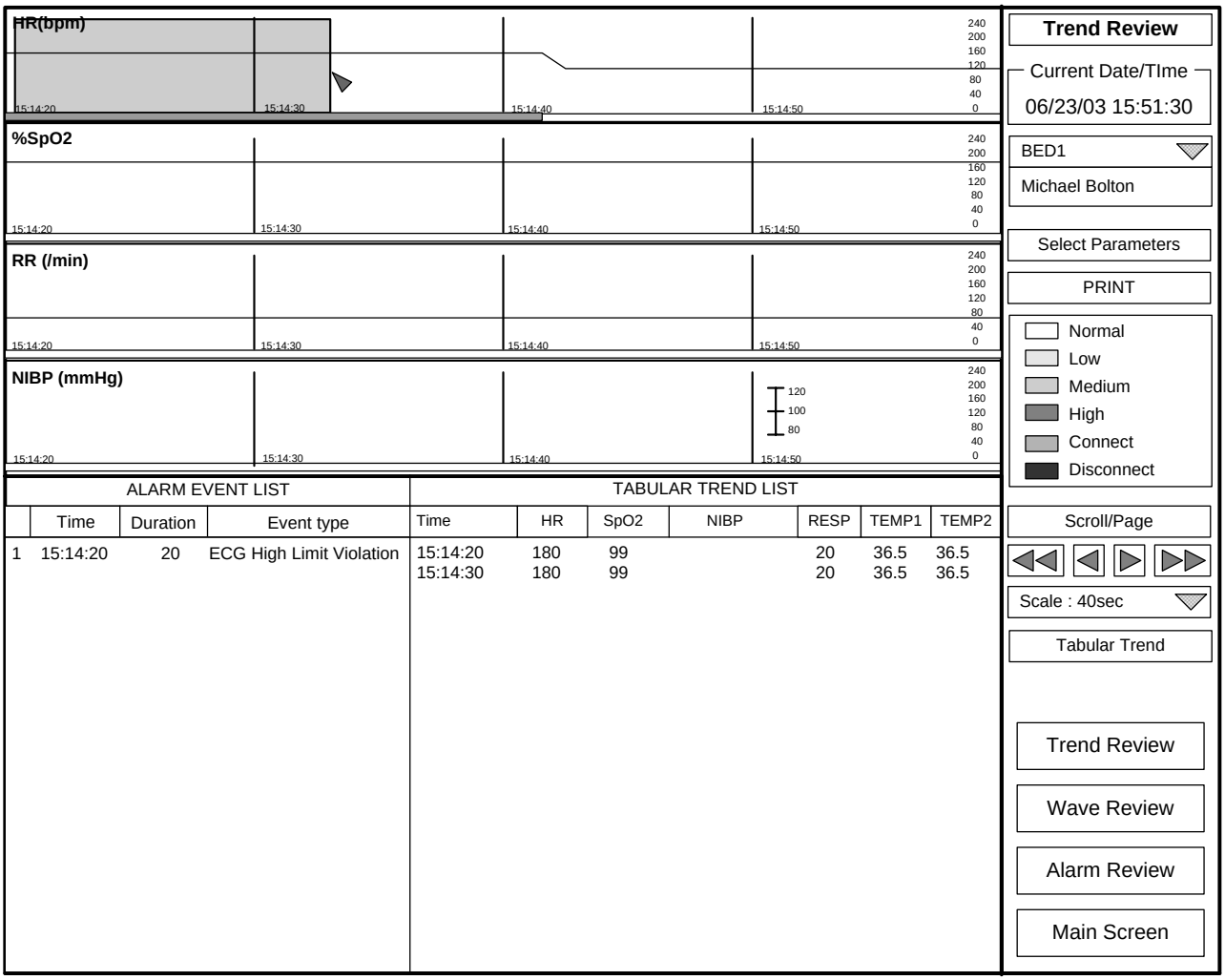


Figure 34. Trend Review Display

The Trend Review Window displays graphs of a patient's physiological parameters collected over time from a bedside monitor. Trend data is available for up to the last 48 hours. It also shows the Event List and Tabular Trend List. All parameters that are stored can also be trended.

The Graphical trend is displayed on the top area in the trend review window. In the graphical trend area, four trend graphs are presented at one time. The Graphical Trends screen contains graphical trend plots of heart rate, pulse rate, SpO_2, NIBP, Temperature and respiration rate measurements.

The vertical scale on each graphical trend display shows the values of the measured parameter. The selected time scale is displayed horizontally on each graphical display. The beginning time of the time displayed is shown on the left, and the ending time of the time scale is shown on the right.

The Event bar is displayed under the each graphical trend section with the color associated with the priority of the alarm. The length of an event bar reflects the length of the event. In the middle right side of the Trend review window, the list shows the color code of the event bar.

For each blood pressure measurement, the NIBP graphical trend display shows a vertical bar with a horizontal bar on top and bottom, and between these horizontal bars. The top horizontal bar is the systolic blood pressure measurement. The bottom horizontal bar is the diastolic blood pressure measurement. The horizontal bar in the middle of vertical bar is the mean blood pressure measurement.

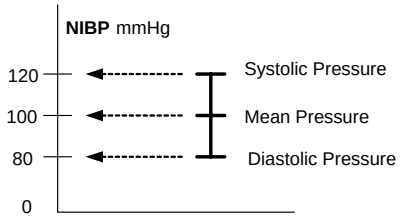


Figure 35. NIBP Graphical Trend Display Format

Bed selection:
Click "▽" to select a desired bed to view Trends.

Print:
To print a report with the trends, click the Print button on the right side of the window.
A report of the trends you are viewing is printed on a laser printer connected to the CMS computer.

Select Parameters:
Click the Select Parameters button, then Select Parameters window prompts.
You can select heart rate, pulse rate, SpO2, NIBP, temperature and respiration rate measurements in the parameter window.

Scroll/Page:
Click the Left single Arrow and the Right single Arrow button to move the displayed graphical trend window backward or forward in time by one-fourth of the selected time scale.
Click the Left double Arrow and the Right double Arrow button to move the displayed graphical trend window backward or forward in time by the selected time scale.
When 48 hours is the displayed time scale, the graphical window does not move.

Scale:
When the Trend Data screen is initially displayed, a time scale of 1 hour is the selected time scale for the graphical trend displays.
The time scale of the trend display is selectable to 40 seconds, 1 hour, 6 hours, 12 hours, 24 hours and 48 hours.

Wave Review:
To display the Wave Review, click the “Wave Review” button.

Alarm Review:
To display the Alarm Review, click the “Alarm Review” button.

Main Screen:
To remove the Trend review window, click the “Main Screen” button.

Tabular Trend

The Tabular trend list is on the lower right side of the Trend review window. This list shows trend data by 10 seconds time scale.
The Trend review allows you to review individual data and their corresponding information associated with that time. When the time interval selected contains more individual trend data than can be displayed, the corresponding tabular trend data is displayed when you access the mouse pointer.
To begin reviewing individual data for tabular trend, first move the mouse pointer on the waveform in the graphical trend area, click and hold the left mouse button, and then drag the mouse pointer to the data point you want to see. When you select the data area on the waveform, tabular trend data is displayed in the tabular trend list. As you move the mouse pointer, the tabular trend list will change correspondingly.
When you no longer want to see the selected data area, click the number of listing (1, 2, 3, …) to remove the selected data area on the waveform areas.

Event List

The Event list is on the lower left side of the Trend review window. This list shows the duration of the alarm event and alarm status message. The most recent alarm detected by the CMS monitoring system appears at the top of the list.

Similar to reviewing the tabular trend list, the corresponding alarm event is displayed when you select the data area by accessing the mouse pointer.
To begin reviewing an individual alarm event, first move the mouse pointer on the waveform in the graphical trend area, click and hold the left mouse button, and then drag the mouse pointer to data point you want to see. When you select the data area on the waveform, Alarm event is displayed in the Event list. As you move the mouse pointer, the event list will change correspondingly.

When you no longer want to see the selected data area, click the number of listing (1, 2, 3, …) remove the selected data area on the waveform areas.

Wave Review

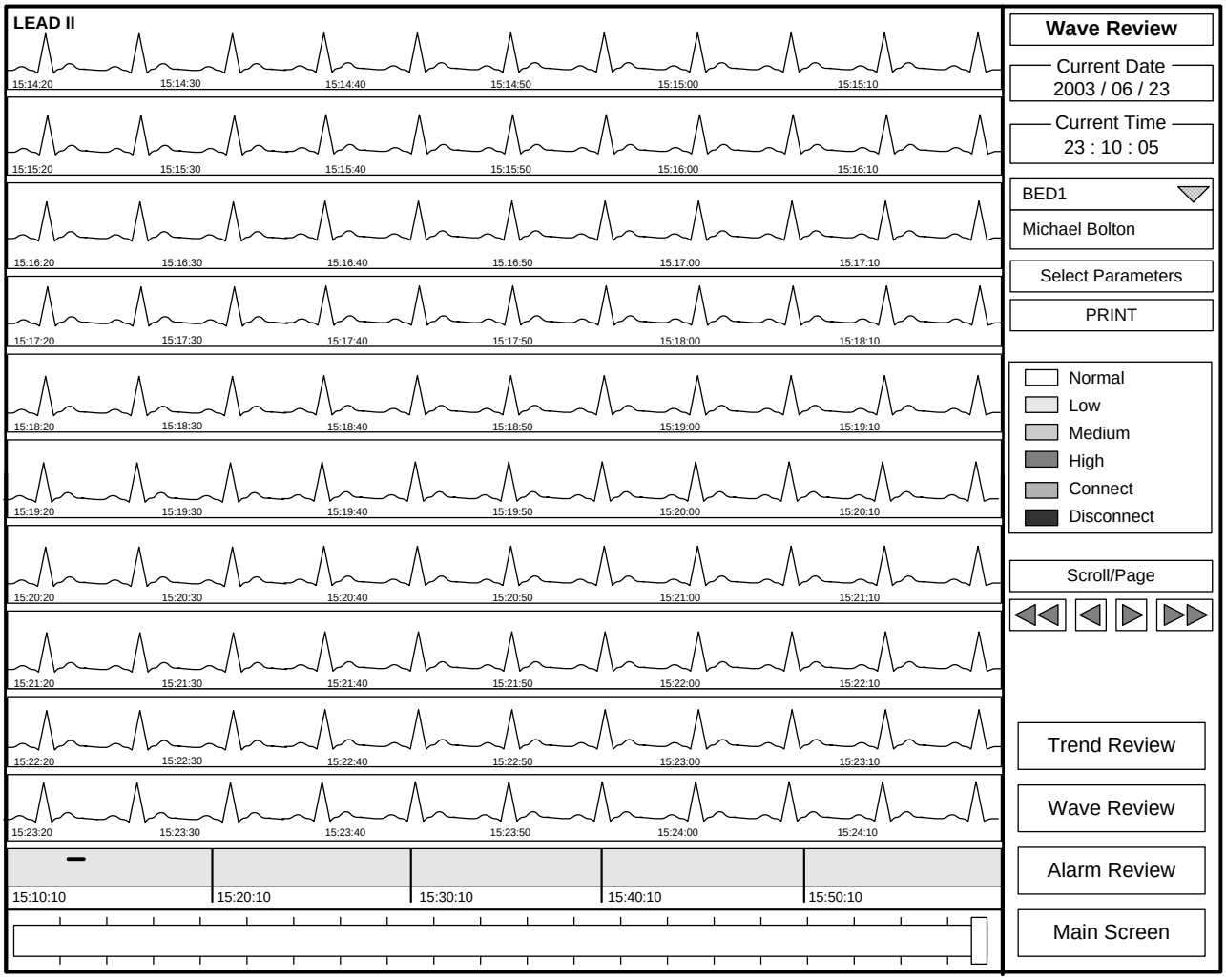


Figure 36. Wave Review Display

The Wave Review Window allows you to view continuous waves that have been stored for a patient. All waveforms can be stored for each patient.

The Wave Review Window contains two components: the actual full disclosure waves in the top part, and navigation in the bottom part. You can use the navigation area to select a focus for the waves.

Under each waveform, the event bar is displayed. The event bar is color-coded as associated with the priority of the alarm, and the length of an event bar reflects the length of the event. In the middle right side of the Wave review window, the list shows the color code of the event bar.

The entire window contains waves. You can use the Timeline at the bottom of the window to navigate. The initial time period corresponds to the amount of storage available (48 hours). The timeline contains two components: 1 hour scale of timeline, and 48 hours scale of timeline.
You can display the Events and look at waves for events of interest. By clicking in the event area and moving the window, you can displays the waves for that event.

Bed selection:
Click "▽", to select a desired bed to view Trends.

Select Waves:
Click "Select Waves" button, then Select Waves window prompts.
You can select ECG (Lead I, II, III, C, aVR, aVL and aVF), SpO_2 and Respiration waves.

Scroll/Page:
Click the Left single Arrow and the Right single Arrow button to move the displayed wave window backward or forward in time by 1 minute time scale.
Click the Left double Arrow and the Right double Arrow button to move the displayed wave window backward or forward in time by 10 minutes time scale.

Print:
To print a report with the wave review, click the Print button on the right side of the wave window.
A report of the wave review you are viewing is printed on a laser printer connected to the CMS computer.

Trend Review:
To display the Trend Review, click the "Trend Review" button.

Alarm Review:
To display the Alarm Review, click the "Alarm Review" button.

Main Screen:
To remove the Wave review window, click the "Main Screen" button.

Alarm Review

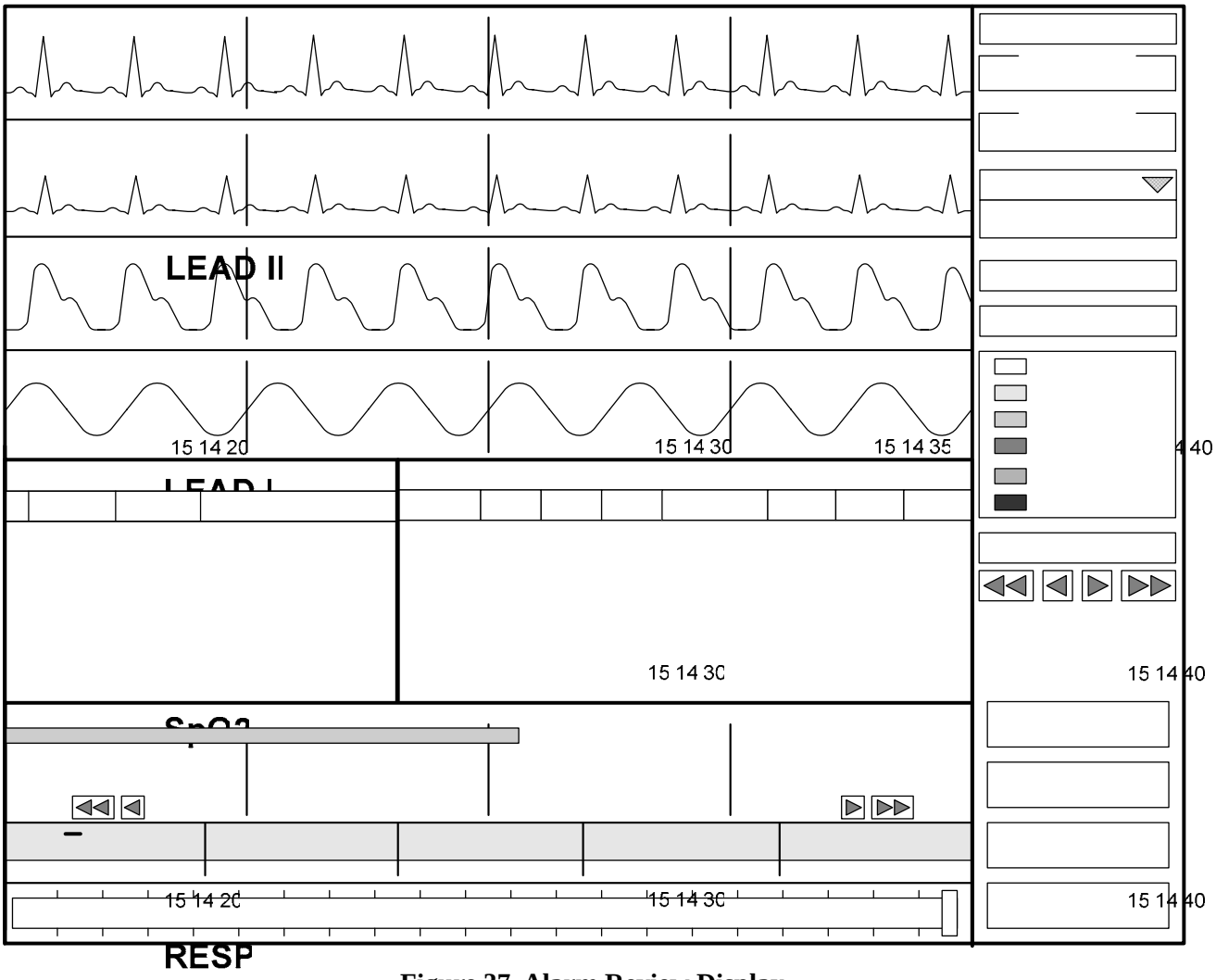


Figure 37. Alarm Review Display

The Alarm Review Window allows you to view up to 100 stored alarms and saved waves. Stored alarms are alarms that are automatically added to alarm history when the alarm is generated.

The waveform is displayed on the top area in the alarm review window. In the waveform area, four waveforms are displayed at one time. You can select the waveform that the waveform area displays: ECG (Lead I, II, III, C, aVR, aVL and aVF), SpO_2 and Respiration waves.

The Tabular trend list is on the lower right side of the Alarm review window. This list shows trend data by 10 seconds time scale.

The Event list is on the lower left side of the Alarm review window. This list shows the duration of the alarm event and alarm event type. The most recent alarm detected by the CMS monitoring system appears at the top of the list. You can display the event's corresponding trend data by double-clicking on the event number in the list. The waveform area and the tabular trends area will adjust to display the trend data corresponding to the event you selected.

The timeline area contains three components: 40 seconds scale for timeline, 1 hour scale of timeline, 48 hours scale of timeline. You can use the Timeline at the bottom of the window to navigate.

The Event bar is displayed on the timeline area with the color associated with the priority of the alarm. You can display the Events and look at waves for events of interest. By clicking in the event area, moving the window displays the waves for that event. In the middle right side of the Alarm review window, the list shows the color code of event bar.

Bed selection:
Click "▽", you can select a desired bed to view Trends.

Select Waves:
Click "Select Waves" button, then Select Waves window prompts.
You can select ECG (Lead I, II, III, C, aVR, aVL and aVF), SpO_2 and Respiration waves.

Scroll/Page:
Click the Left single Arrow and the Right single Arrow button to move the displayed waveform window backward or forward in time each by 10 seconds time scale.
Click the Left double Arrow and the Right double Arrow button to move the displayed waveform window backward or forward in time each by 40 seconds time scale.

Print:
To print a report with the alarm review, click the Print button on the right of the window.
A report of the alarm review you are viewing is printed on a laser printer connected to the CMS computer.

Trend Review:
To display the Trend Review, click the "Trend Review" button.

Wave Review:
To display the Wave Review, click the "Wave Review" button.

Main Screen:
To remove the Alarm review window, click the "Main Screen" button.

Alarm Indications

The CMS provides indications of physiological and technical alarms. When a monitored patient parameter exceeds a limit set at the bedside monitor or when a technical condition occurs, an alarm is indicated visually and audibly at the CMS. Physiological and technical alarms are categorized as high (red-flash), medium (yellow-flash) and low priority (yellow-constant). Each alarm has unique visual and audible characteristics. An alarm message is also displayed on the Patient sector as for an individual bed. For the detailed alarm conditions, indications and messages, refer to the **Alarms and limits** section of the operation & service manual for each patient monitor.

Alarm Silence

An alarm is silenced at the CMS using the Alarm button, or an alarm is silenced at the CMS when it is silenced at the bedside monitor. The alarm is silenced at the CMS for an alarm silence period as Silence period setting at bedside monitor.

If an alarm has been silenced, the alarm silence period for that alarm has elapsed, and the same alarm condition still exists, the audible alarm sounds again.

Alarm Suspend

WARNING: If an alarm condition occurs while in the Alarm Suspend state, the only alarm indication at the CMS will be visual displays related to the alarm condition.

An alarm is suspended at the CMS when it is suspended at the bedside monitor.
For all beds, if Patient alarms at the CMS have Audible volume set to “0”, an alarm suspend symbol is always displayed on the Alarm button whether or not there is an active alarm at the bedside monitor.

CAUTION: When an individual bed side monitor is set to alarm suspend, you may not control this alarm suspend from the CMS.

Recording and Report

The intended use of the Recorder is to provide hardcopy of text and wave data for the YM9000 CMS.

Recording

Recordings can be automatically generated by alarm events, or you can manually request them. The one-shot recording contains the primary and secondary waves selected on the Setup window.

A one-shot recording is a non-continuous, timed recording that shows waves prior to your record request along with a few seconds of waveforms after your request. A one-shot recording has a 30 (10, 20) second print, recording real-time graphical and numeric information beginning 15 seconds before the print initiation and ending 15 seconds after that event.

When you want to record patient's data through the recorder, click the Record button. The Recorder printout begins with the standard header (printing date and time) followed by current numeric values: Heart rate (HR), respiration rate, blood pressures (Sys/Dia/MAP), oxygen saturation (SpO_2), Pulse rate, and temperature (T1/T2). If there is no measurement at the moment of the printing, for example blood pressure, dashes (-) will be presented.
After printing parameters, real-time waveforms are printed out on the display in the Main screen. You can select the number of printout waveform in the Setup window.
Time is printed along the top of the paper, followed by real-time waveforms including waveform information; sweep speed, size, and lead configuration (I, II, III, aVR, aVL, aVF or C).
The recorder speed is configured at 25 mm/s.

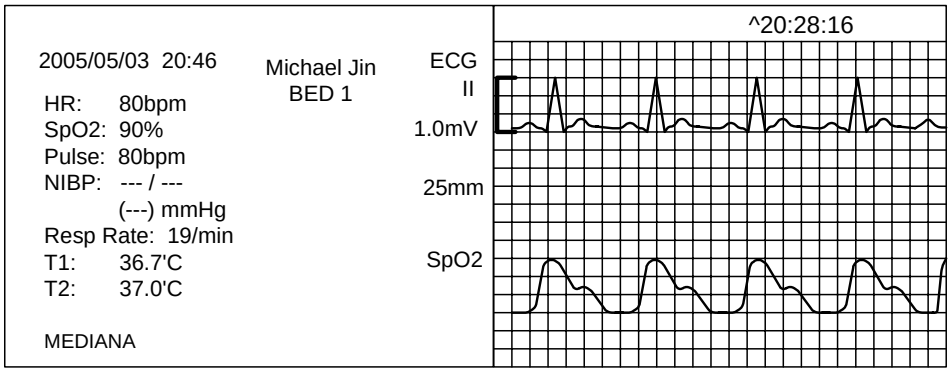


Figure 38. One–Shot Printout

When the Print-on-alarm is set to "On", a 30 (10, 20) second one-shot printout is made automatically each time a high or medium priority (out-of limits) alarm condition occurs. The Print-on-alarm operation is selected in the Setup window.

Report

You can print a report on an optional laser printer connected to the CMS computer.

To print a patient trend review report, click the Print function button in the Trend review window.

The First part of the patient trend report contains patient information. The second part contains graphic trends of heart rate, %SpO_2, NIBP, temperature and respiration rate measurements. The vertical scale on each graphical trend shows the values of the measured parameter. The time scale selected in system setup is displayed horizontally on each graphical display. For each blood pressure measurement, the NIBP graphical display appears in the printout as it does on the Graphical Trends screen. The third part of the patient trend report contains a tabular trend list and an event list.

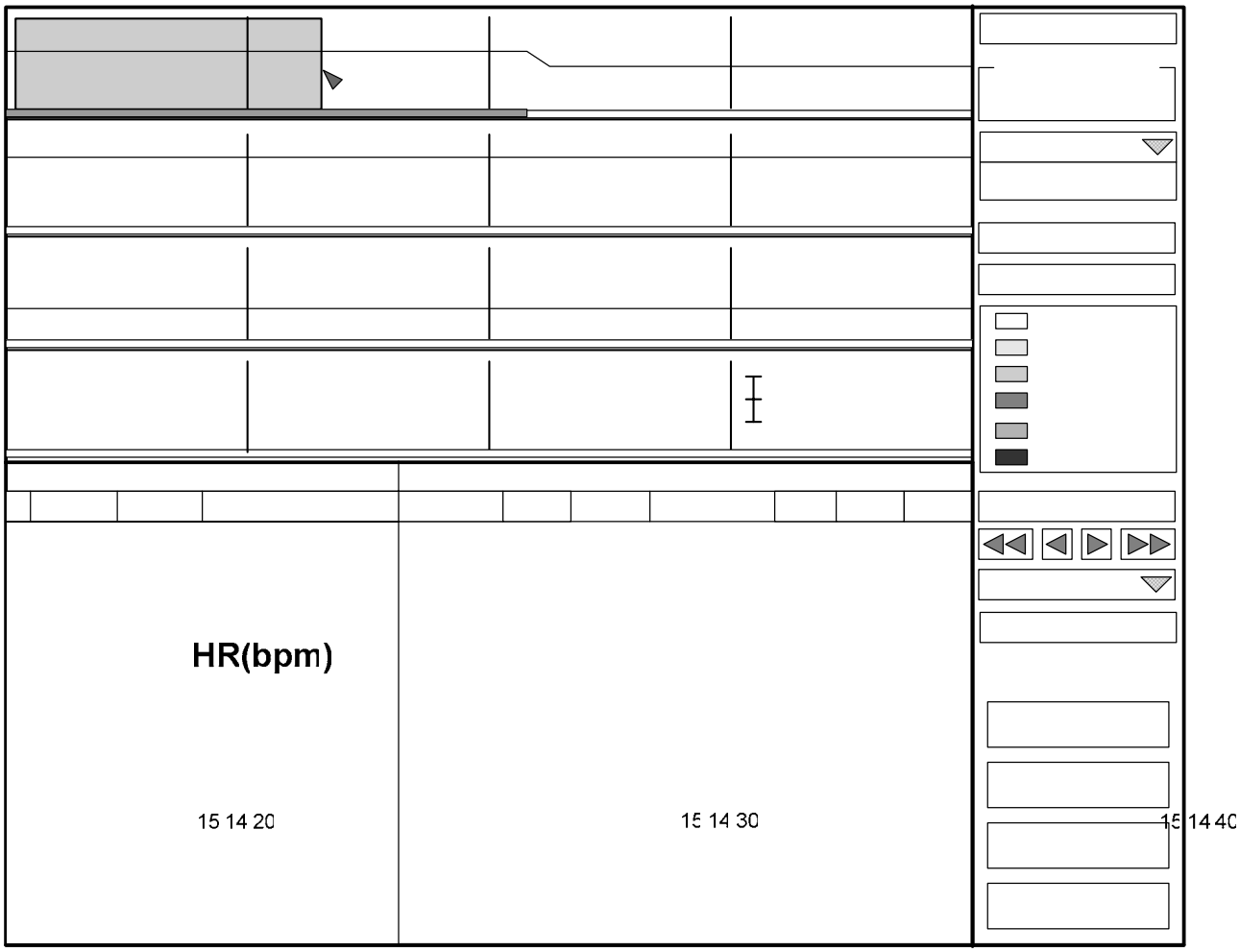


Figure 39. Trend Review Report

To print an alarm review report, click the Print function button in the Alarm review window.
The first part of the alarm review report contains patient information. The second part contains waveforms of ECG, SpO_2, and respiration rate. The time scale is displayed horizontally on each graphical display. The third part of the patient trend report contains a tabular trend list and an event list.

15 14 20
15 14 30
15 14 40
RR (/min)

To print a wave review report, click the Print function button in the wave review. The first part of the wave review report contains patient information. The second part contains waveforms of ECG, SpO_2, and respiration rate that selected in the review window. The time scale is displayed horizontally on each graphical display.

15 14 20
15 14 30
15 14 40
NIBP (mmHg)

15 14 20
15 14 30
15 14 40

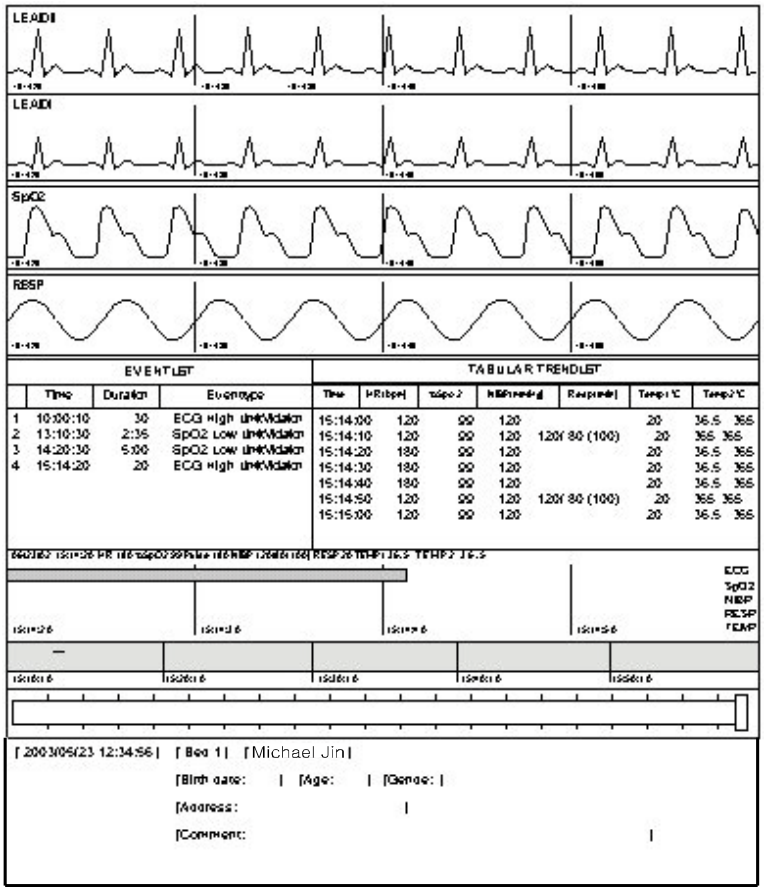


Figure 40. Alarm Review Report

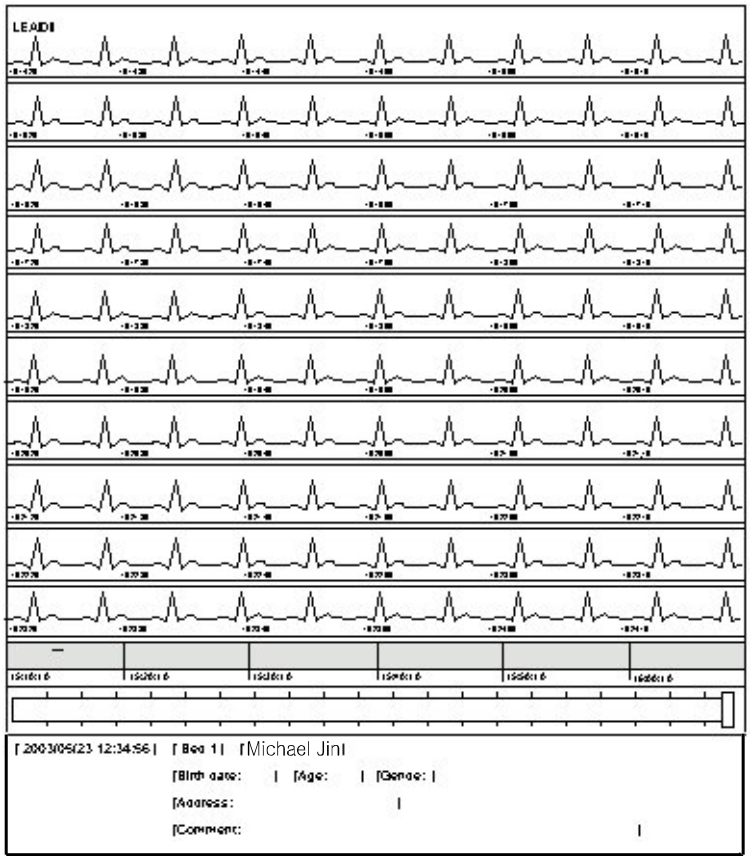
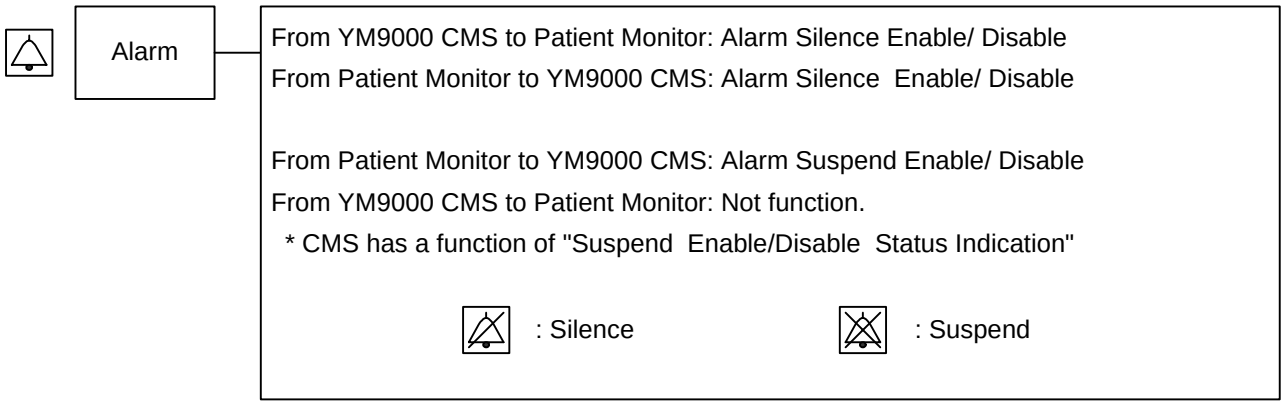


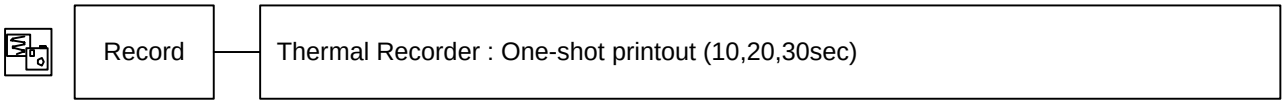
Figure 41. Wave Review Report

Menu Trees

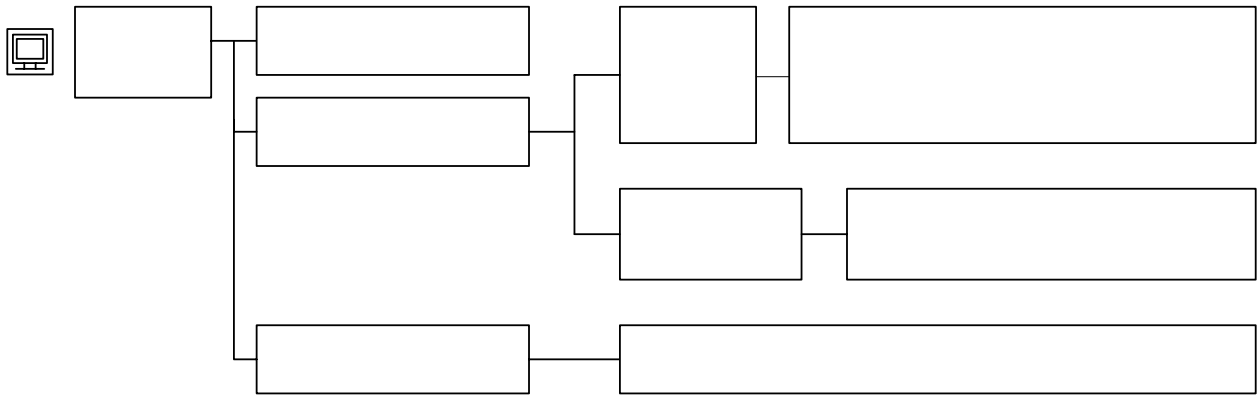
Alarm


Alarm
From YM9000 CMS to Patient Monitor: Alarm Silence Enable/ Disable
From Patient Monitor to YM9000 CMS: Alarm Silence Enable/ Disable
From Patient Monitor to YM9000 CMS: Alarm Suspend Enable/ Disable
From YM9000 CMS to Patient Monitor: Not function.
* CMS has a function of "Suspend Enable/Disable Status Indication"
: Silence
: Suspend

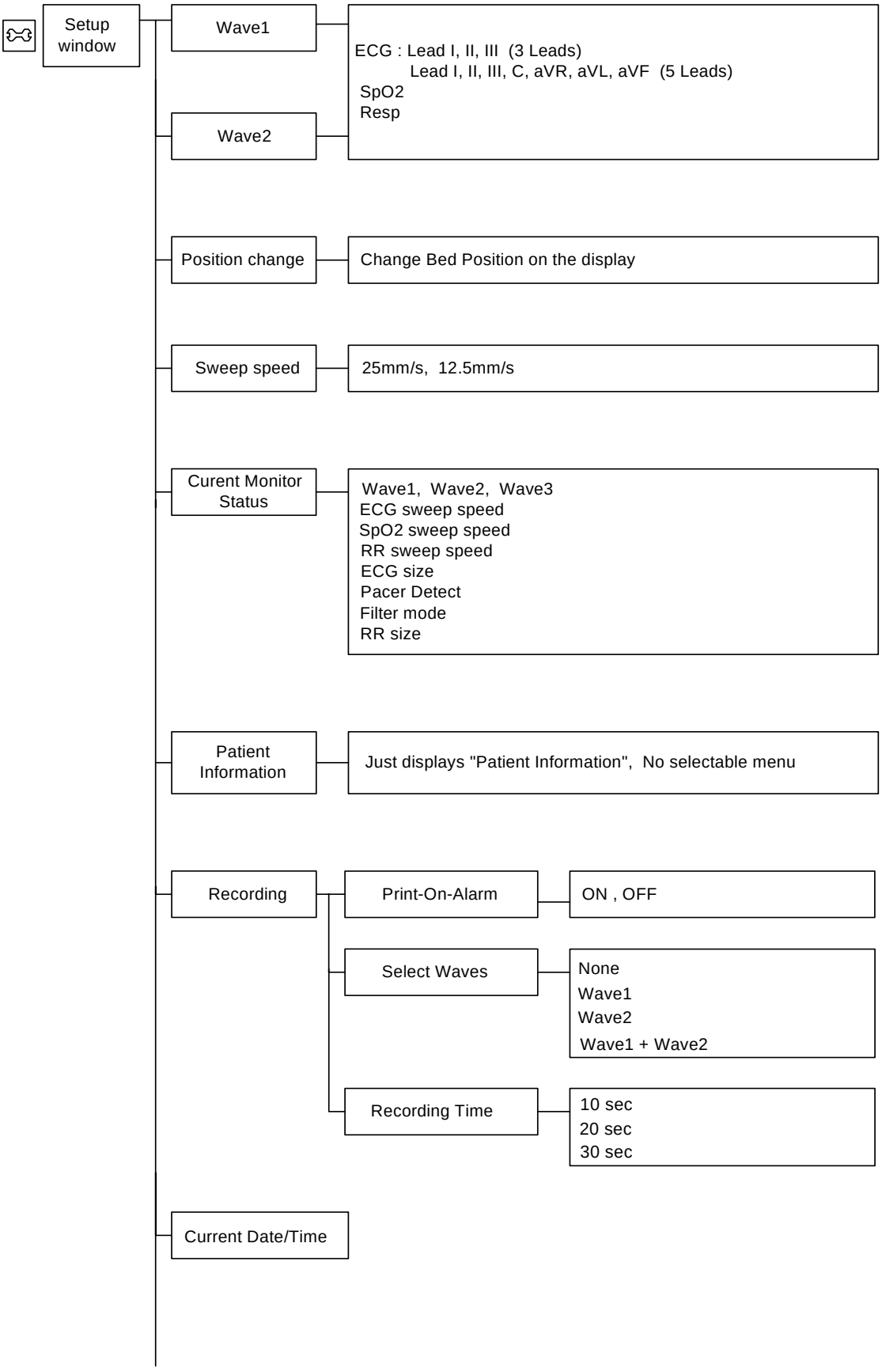
Record

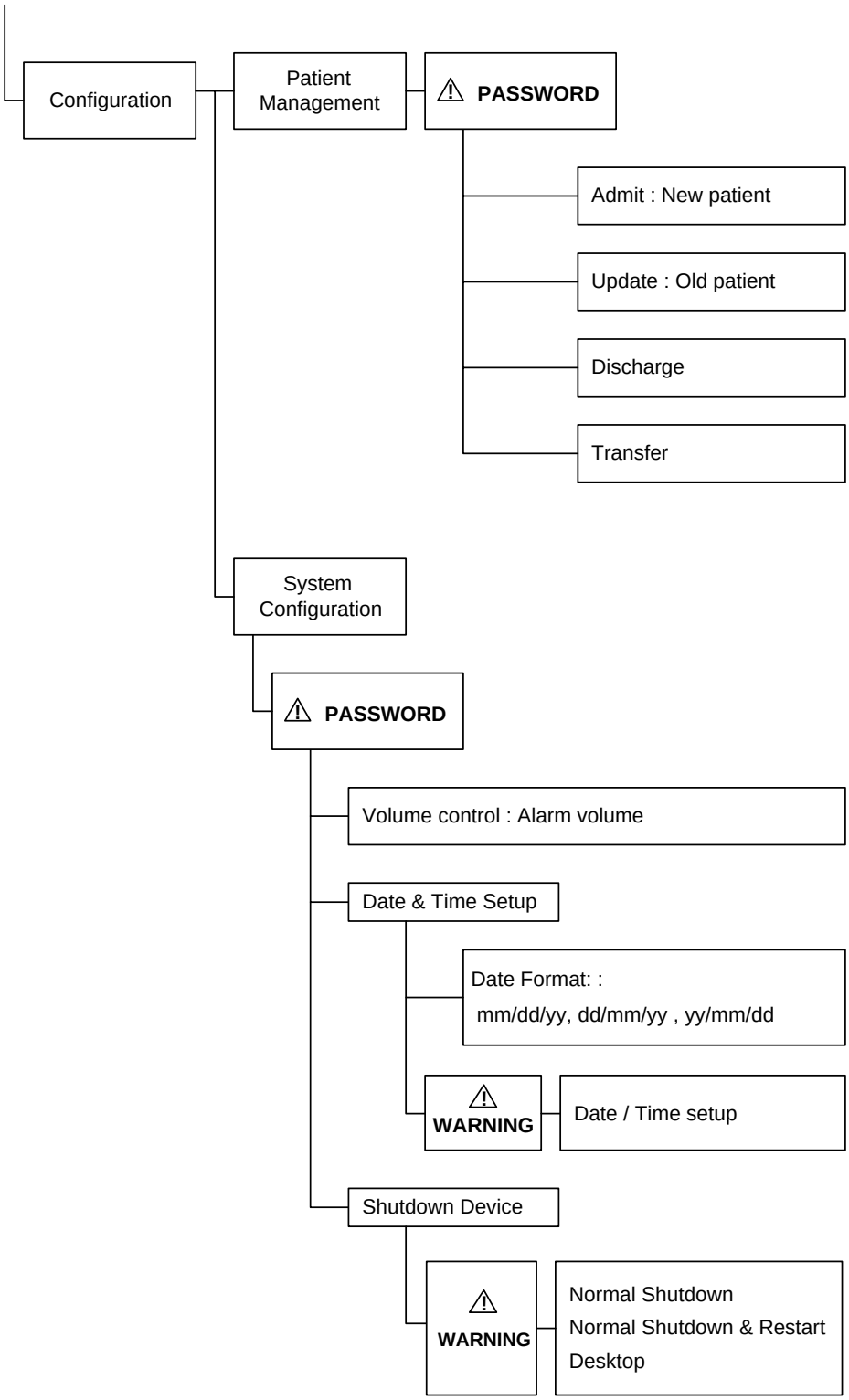


Patient Window



Setup Window




Configuration
Patient Management
⚠ PASSWORD
Admit : New patient
Update : Old patient
Discharge
Transfer
System Configuration
⚠ PASSWORD
Volume control : Alarm volume
Date & Time Setup
Date Format: :
mm/dd/yy, dd/mm/yy , yy/mm/dd
⚠ WARNING
Date / Time setup
Shutdown Device
⚠ WARNING
Normal Shutdown
Normal Shutdown & Restart
Desktop

Patient Data Window

Patient Data Review

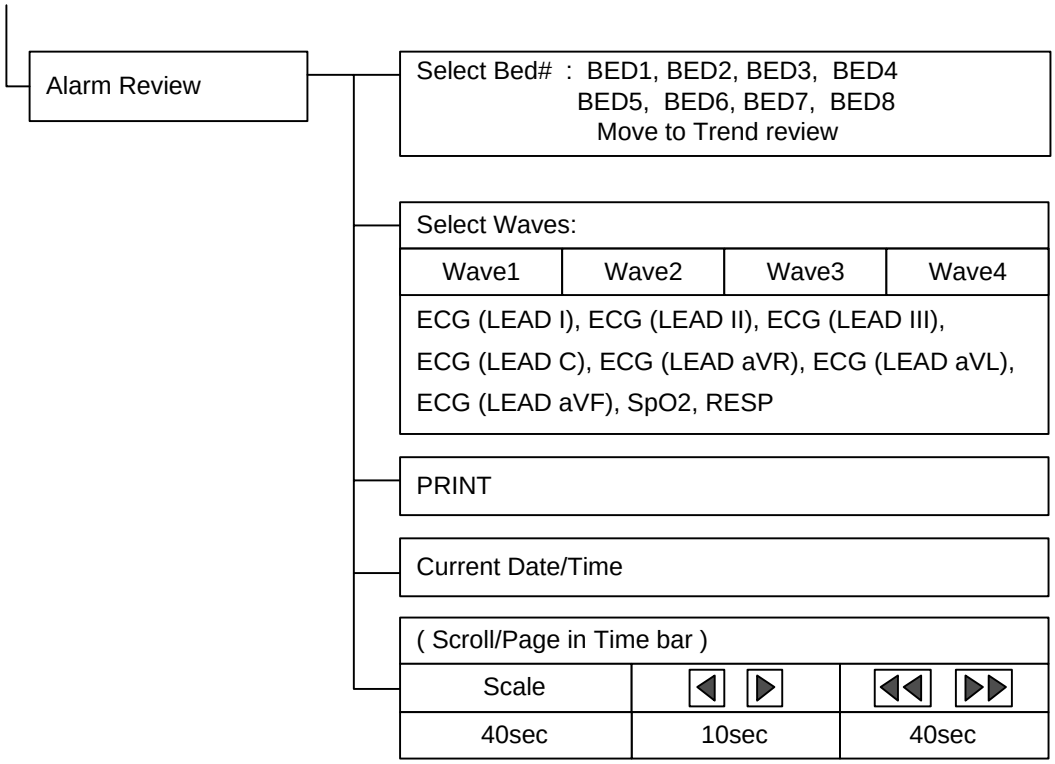
- Trend Review
  - Select Bed# : BED1, BED2, BED3, BED4 BED5, BED6, BED7, BED8 Move to Trend review
  - PRINT
  - Select Parameters: HR, PULSE, %SpO2 , RR NIBP, T1, T2
  - Scroll/Page

Scale	◀ ▶	◀◀ ▶▶
40sec	10sec	40sec
1hour	15min	1hour
6hour	90min	6hour
12hour	3hour	12hour
24hour	6hour	24hour
48hour	12hour	-

  - Scale : 40sec, 1hour, 6hour, 12hour, 24hour, 48hour
  - Current Date/Time
- Wave Review
  - Select Bed# : BED1, BED2, BED3, BED4 BED5, BED6, BED7, BED8 Move to Trend review
  - Select Waves: ECG (LEAD I), ECG (LEAD II), ECG (LEAD III), ECG (LEAD C), ECG (LEAD aVR), ECG (LEAD aVL), ECG (LEAD aVF), SpO2, RESP
  - Scroll/Page

◀ ▶	◀◀ ▶▶
1min (60sec)	10min (600sec)

  - PRINT
  - Current Date/Time


Alarm Review
Select Bed# : BED1, BED2, BED3, BED4
BED5, BED6, BED7, BED8
Move to Trend review
Select Waves:
Wave1
Wave2
Wave3
Wave4
ECG (LEAD I), ECG (LEAD II), ECG (LEAD III),
ECG (LEAD C), ECG (LEAD aVR), ECG (LEAD aVL),
ECG (LEAD aVF), SpO2, RESP
PRINT
Current Date/Time
(Scroll/Page in Time bar)
Scale
40sec
10sec
40sec

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QUICK INSTALLATION & START-UP GUIDE

Hardware installation

1. For the CMS installation, connect the keyboard, the mouse, the Lock-key, the Laser printer cable and the video cable at the back of the computer. Connect the power cord to AC power through the Isolation transformer. Refer to the *Computer in the CMS setting* section.
2. For the External Thermal Recorder installation, connect the RS-232 serial data cable at the rear panel of the recorder, and connect the other end of the serial data cable to the PC. Connect a power cord to AC power through the Isolation transformer.
3. Connect the LAN cable to the Ethernet adaptor at the back of the computer. Connect the other end of the LAN cable to the any one port at the rear panel of the hub.
4. Connect the LAN cable to the Network connector of the patient monitor, and connect the other end of the LAN cable to any port at the rear panel of the hub.
5. For the Hub installation, connect the DC adaptor to the adaptor jack at the rear panel of the hub. Verify that the power led is lit at the front panel of the hub.
6. For the bedside monitor monitor setting, set the patient monitor for the CMS.
   Refer to the Bedside monitor settings section.

Software installation

7. Insert the CD. Install the CMS application software.
   Refer to the Software installation section.

Start-up & Operation

8. Verify that the Link/Act led is lit at the front panel of the hub when the other end of the LAN cable is connected to a monitor that is powered on.
9. After turning on the computer, verify that the monitor displays a copyright screen.
10. You may click “bed-selection” buttons in correspondence with your CMS options (8 or 16 beds with a single display, and 16 beds with dual displays).
11. Verify that the patient sector with bed number is displayed in the Main screen.
12. Verify that CMS indicating dot appears green in the bedside monitor.
13. Set the date and time in the System Configuration window.
    Refer to *the System Configuration in the Setup window* section.
14. Admit a patient in the Patient Management window.
    Refer to *the Patient Management in the Setup window* section.
    After a patient is admitted, patient data is stored in the YM9000 CMS.
15. Click the Setup window button in the Main screen, then verify that the current date and time is set correctly and the patient information is displayed as you entered.
16. Click the Recorder button in the Main screen. Verify that the Recorder prints out a 10 (or 20 or 30) second one-shot recording.

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MAINTENANCE & TROUBLESHOOTING

Maintenance

Before using the CMS to monitor patients:

- Check for any mechanical damage.
- Check all the external leads, input data connections and accessories.
- Check all the functions of the instrument which will be needed to monitor the patient, and ensure that the instrument is in good working order.
- Do not use the YM9000 CMS for any monitoring procedure on a patient if you identify impaired functioning of the instrument. Contact the hospital biomedical engineer, or the Mediana service engineer.
- If liquid is accidentally spilled on the YM9000 CMS, clean and dry thoroughly before reuse.
- If in doubt about the YM9000 CMS safety, refer the unit to qualified service personnel.

Cleaning

The equipment should be kept clean and dry. This section describes several routine maintenance procedures.

The Recorder has mechanical and optical components that require regular cleaning for dependable operation. This includes cleaning the paper-out sensor and the paper roller to prevent paper slippage and keep recordings clear and clean.
Cleaning the paper-out sensor and interior of the Recorder can be done with a container of compressed air.

The exterior surfaces of the YM9000 CMS components should be regularly cleaned of dust, lint, and dirt. To clean equipment surfaces, use a lint-free cloth or sponge, moistened with soap and water (a dilute, non-caustic, detergent solution).

> **NOTE** Refer to the cleaning instructions in the directions for use for such local supplies as a PC or a PC monitor.

Periodic Safety Checks

We recommend that full performance checks be done by qualified service personnel every 6 to 12 months and after every repair or upgrade. See your YM9000 CMS Service Manual for additional information.

All checks which require the instrument to be opened must be made by qualified service personnel. Safety and maintenance checks can also be made by Mediana qualified service personnel. Your local Mediana office will be glad to give you information about service contracts.

Replacement of Recorder Paper

1. Open the door by pushing both sides of (a) and (b) of the recorder slightly and pulling the door out. The door should tilt open.
2. Reach in and remove the depleted paper core by pulling it towards you gently with your thumb on top and your forefinger and/or index finger underneath it.
3. Place a new paper roll between the paper holder. Orient the paper roll.
4. Unroll the paper towards you until approximately 2 inches (5.08 cm) of paper have been unrolled.
5. Align the paper with the pinch roller attached to the recorder door.
6. Holding the paper against the roller, close the recorder door.
7. To ensure that the paper is aligned in the slot and has not been pinched in the door, pull the loose edge until a few inches of paper is showing. If the paper will not move, open the door and return to alignment step 5.

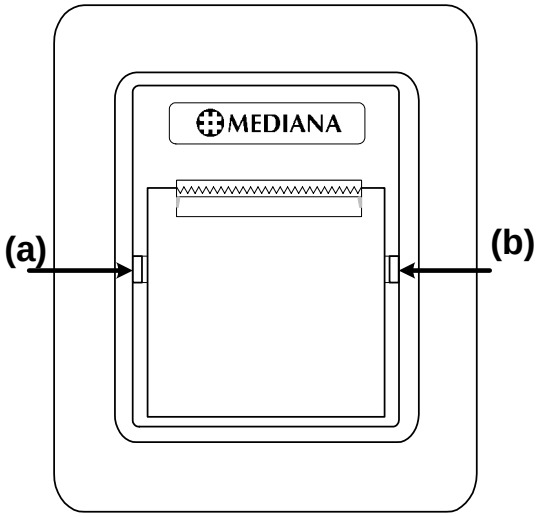

Figure 42. Replacement of Recorder Paper

CAUTION: Restart the External Thermal Recorder after the PC is rebooted. Otherwise the External Thermal Recorder does not properly operate.

Checking Software Version

To display the version of the installed software, click the Setup button to display the Setup window. Refer to Figure 36, Check the version of the installed software at the bottom right of the Setup window.

Troubleshooting

For technical information and assistance, or to order the YM9000 CMS Service Manual, call Mediana's Technical Services Department or your local Mediana representative. The service manual includes information required by qualified service personnel when servicing the YM9000 CMS Service Manual.

Qualified service personnel in the user's institution should perform periodic inspections of the monitor in accordance with the YM9000 CMS Service Manual. If service is necessary, contact qualified service personnel or your local Mediana representative.

WARNING: Failure on the part of the responsible individual hospital or institution employing the use of this equipment to implement a satisfactory maintenance schedule may cause undue equipment failure and possible health hazards.

WARNING: When turning off or restarting the PC, you must follow proper 'shut down' instruction (refer to Operation section). If the PC abnormally shuts down, the YM9000 database may be lost and the system would not perform properly.

NOTE Mediana will make availability on the request, in English only, of component part lists, descriptions, calibration instructions or other information which will assist the user's appropriate qualified service personnel to repair those parts of the equipment which are classified by Mediana to be repairable.

Operator Troubleshooting

In the event of technical difficulties, operator troubleshooting is limited to the activities listed in Table 4. This table presents typical problems, probable causes, and suggested actions to correct the problems. For any problems not listed in Table 9, contact your system administrator or your facility clinical engineer or the Mediana Technical Services Department.

Table 4. Troubleshooting

Problem	Possible Cause(s)	Corrective Action(s)
CMS does not turn on or has shut off unexpectedly.	AC power cord is unplugged or disconnected from the Isolation Transformer, the computer, or the monitor.	Check that power cord is plugged into the Isolation transformer, the wall receptacle, the computer, and the monitor. Plug in power cords as needed.
	The power switch on the Isolation transformer is turned off.	Check the Isolation transformer power switch is turned on. Turn On if necessary.
Communication link is lost or Intermittent between a bedside monitor and the CMS	Power to the bedside monitor is lost or intermittent.	Check that AC power cord is securely plugged into the wall receptacle and that power is available at the receptacle. Plug in power cord as needed. Check that power cord is securely connected to the bedside monitor. Reconnect power supply as needed.
	LAN cable is disconnected at the bedside monitor.	Check LAN cable connections at the bedside monitor. Reconnect cable as needed.

Problem	Possible Cause(s)	Corrective Action(s)
	LAN cable is disconnected at the CMS.	Check LAN cable connections at the CMS. Reconnect cable as needed.
	Power to the Hub is lost or intermittent	Check that Adaptor is plugged into the hub and the wall receptacle. Reconnect adaptor as needed.
	The TCP/IP module may be defected as all the connections are secured.	Contact your facility clinical engineer or the Mediana Technical Services Department to replace the rear board of the bedside monitor.
The CMS resets and restarts unexpectedly	There is a problem with the CMS computer.	Contact your facility clinical engineer or the Mediana Technical Services Department.
	AC power cord connection(s) are loose at the CMS.	Check that the power cord is plugged into the Isolation transformer, the wall receptacle, the computer, and the monitor. Plug in power cords as needed.
The CMS is abnormally disconnected during the operation and cannot be reconnected.	The software and TCP/IP module that are appropriate to the bedside monitor are not installed.	Check that the bedside monitor is installed with the latest software (note: the software for the YM5500 monitors should be 1.05.32/1.05.33 or more). Contact your facility clinical engineer or the Mediana Technical Services Department to update the software and to replace the rear board of the bedside monitor.
Some bedside monitors are not connected after the initial installation.	The first trial to connect the CMS will take over 5 minutes after the initial installation.	Wait over 5 minutes, and then run the CMS.
The CMS resets and restarts unexpectedly	There is a problem with the CMS computer.	Contact your facility clinical engineer or the Mediana Technical Services Department.
	AC power cord connection(s) are loose at the CMS.	Check that the power cord is plugged into the Isolation transformer, the wall receptacle, the computer, and the monitor. Plug in power cords as needed.
YM9000 application software does not access.	The Lock-key connection is loose at the CMS.	Check that the Lock-key is inserted into the parallel port at the back of the computer and tighten the screws securely.

Error and Status Messages

There are a number of system conditions that can be identified by YM9000 software during routine system assessments. If these conditions occur, the system will immediately display the appropriate error and status message box in the middle of the Main Screen.

Table 5. Error Messages

Message	Possible Cause(s)	Corrective Action(s)
Recorder Error Message		
Recorder Link Error	- No Recorder is in Recorder Rack - Recorder is inoperable.	- Insert Recorder in Recorder Rack - Reseat Recorder in Recorder Rack - Replace Recorder in Recorder Rack
Recorder Paper Error	- Recorder is out of paper - Recorder door is open	- Replace paper roll - Close Recorder door
Printer Error Message		
Window of No Printer connected	- System does not recognize any connected printer	- Check printer connection. - Check printer configuration
Window of Check printer for problems	- Printer has a paper jam - out of paper	- Remove paper jam - Add paper to printer
Other message		
Window of System error	- Operation of System has failed	- System will reboot. If problem persists, contact Mediana's Technical Service Department.
Bed number communication link is lost or offline	- LAN cable is disconnected - Power to the Hub is lost	- Check LAN cable connections - Check that Adaptor is plugged into the Hub

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SPECIFICATIONS & ACCESSORIES

Specifications

Display

Monitor

- Display type: CRT color or Flat panel PC monitor
- Resolution: 1280 × 1024
- Size: 17 inch or more

Software

- Up to 16 patient sectors, with up to 32 waveforms per screen single display or dual displays.
- Sweep speed is 25mm/s and 12.5mm/s depending on configuration.
- Display formats are:
  8 patients: 8 × 1
  16 patients: 8 × 2 (Dual displays)
  16 × 1 (Single display)
- Waveforms are about 4 seconds in length in a dual column format and about 10 seconds in length in a single column format.
- Number of waves in Patient Window: 4
- Number of parameters in Patient Window: 7

Power Source Requirements

- AC mains from the Isolation transformer
  100Vac to 240Vac, 50 Hz/60 Hz, 1kW
  Fuse: q'ty 2, 10.0 A, 250 volts, slow-blow, IEC (5×20 mm)
  AC output voltages are electrically isolated from ac input voltages through the Isolation transformer.
- To protect hospital personnel, the YM9000 CMS must be grounded. Accordingly, the hardware is equipped with detachable 3-wire cables which ground the instrument to the power line ground (protective earth) when plugged into appropriate 3-wire receptacles. If an adequate number of 3-wire receptacles are not available, consult the hospital electrician.

Environment

- The YM9000 CMS operates within specifications at ambient temperatures between 15ºC and 40ºC, relative humidity between 15% and 95%, and altitude between 700 to 1060 hPa. Allow at least 2 inches (5cm) clearance around the instrument for proper air circulation.
- Make sure that during operation, the instrument is free of condensation. Condensation can form when equipment is moved from one building to another, thus being exposed to moisture and differences in temperature.
- The environment where the YM9000 CMS will be used should be reasonably free from vibration, dust, corrosive or explosive gases, extremes of temperature, humidity, and so on.

Features

The YM9000 CMS provides real-time waveform monitoring at a hallway location for up to 16 patients being monitored by Patient monitor on the LAN. The standard YM9000 CMS includes the following features:

- PC (O/S: Windows 2000 professional version) with 43 cm (17") display, keyboard, speaker, and mouse
- External Thermal Recorder
  - 100Vac to 240Vac, 50 Hz/60 Hz, 24kW
    Fuse: q'ty 2, 10.0 A, 250 volts, slow-blow, IEC (5×20 mm)
  - 200 dpi Resolution
  - Recorder paper width: 50mm
  - Dimension: 10.2cm x 16cm x 12cm (W x D x H)
- Application Software Lock-key
  - Dimension: 5.5cm x 4.5cm x 1.5cm (W x D x H)
- Displays up to 16 patients who are monitored by Patient monitor on the LAN
- Up to 16 waveforms on Main Screen display.
- Alarm silencing.
- Accesses real-time waveforms and parameters; accesses data stored by Database.
- 30 seconds alarm records, all waveforms per event. (ECG lead I, II, III, C, aVR, aVL, aVF, C, SpO_2, Respiration)
- 48 hours waveform storage for all waveforms per patient.
- Up to 16 waveforms can be displayed in dual columns and Up to 16 waveforms can be displayed in single column.
- YM9000 can review for up to 48 hours for stored patient monitoring data, waveforms and alarm events.
- Main screen for displaying real time waves and parameters for up 8/16 patients and Patient Window for viewing detailed real time data for individual patients.
- Simultaneous display of trend plots: 4 trend plots
- Trends displayed in 40seconds, 1, 6, 12, 24 and 48 hours time scales.

Options

Options for the YM9000 Center Monitoring System include (Local Supply):

- HUB
  - 16 port for 8 bed CMS
  - 24 port for 16 bed CMS
- Isolation Transformer
  - 100Vac to 240Vac, 50 Hz/60 Hz, 24W
    Internal power fuse: 10.0A, 250 volts, slow-blow, IEC(5×20 mm)
  - Dimension: 20cm x 34cm x 18cm (W x D x H)
- Laser Printer
  - The YM9000 CMS supports printers that are both HPGL/2 and PCL5 compatible with a minimum of 2 megabytes of printer memory such as the Hewlett-Packard
    LaserJet models 4, 4SI, 4L, 5, 5SI, and 5L printers.

Options

- Laser Printer

- The YM9000 CMS supports printers that are both HPGL/2 and PCL5 compatible with a minimum of 2 megabytes of printer memory such as the Hewlett-Packard
- LaserJet models 4, 4SI, 4L, 5, 5SI, and 5L printers.

- PC
  - for 8 bed CMS
    with Windows 2000 professional version O/S
    : Pentium 4 2.0GHz or faster
    minimum 512Mbyte RAM
    20 Gbyte Hard disk drive or more
    (minimum 10Gbyte Hard-disk space available)
    Resolution: 1280×1024 Graphic Card
    External Speaker, Sound Card
    Mouse (PS/2 or USB)
    Keyboard
    CD-ROM drive
  - for 16 bed CMS
    with Windows 2000 professional version O/S
    : Xeon 2.4GHz or faster
    minimum 1Gyte RAM
    30Gbyte Hard disk drive or more
    (minimum 15Gbyte Hard-disk space available)
    Resolution: 1280×1024 Graphic Card
    External Speaker, Sound Card
    Mouse (PS/2 or USB)
    Keyboard
    CD-ROM drive
- Monitor
  : 17" display or Flat panel PC monitor
  Resolution: 1280×1024
  65,536 colors (16-bit)

Dual Display Option for the YM9000 Center Monitoring System provides real-time waveform monitoring at a hallway location for 16 patients being monitored by Patient monitor on the LAN.

- Second display for each of the monitor with 8 patient sectors.
- LAN Cable

- Category 5 UTP cable with straight-Through connection

Maximum LAN cable length is 100m (328 ft.)

NOTE Accessory equipments connected to the CMS must be certified according to IEC 60950 or IEC 60601-1. All combination of the system must be in compliance with IEC 60601-1-1.

NOTE This system complies with the requirements of electromagnetic compatibility system standard IEC 60601-1-2:2001.

List of Accessories Available

Description	Remark	Part Code
YM9000 CMS Application Software CD	Standard	M9005
YM9000 CMS Application Software Lock-key	Standard	M4017
YM9000 CMS Operation & Service Manual	Standard	A7035
External Thermal Recorder for the YM9000 CMS	Standard	AD110
Thermal Recorder Paper (2 inches)	Standard	A0062
Serial data cable (for Recorder)	Standard	A0073
Power code (for Recorder)	Standard	A0085
HUB (16port) for 8 bed CMS	Option	AD308
HUB (24port) for 16 bed CMS	Option	AD316
Isolation Transformer	Option	AD210
PC (for 8-bed CMS) Pentium 4 2.0GHz	Option	AD308
PC (for 16-bed CMS) Intel Xeon, 2.4GHz	Option	AD316
Monitor (17'' for CMS)	Option	AD302
Laser printer (for CMS) HP Laser Printer	Option	AD301
LAN cable (for CMS)	Option	AD305